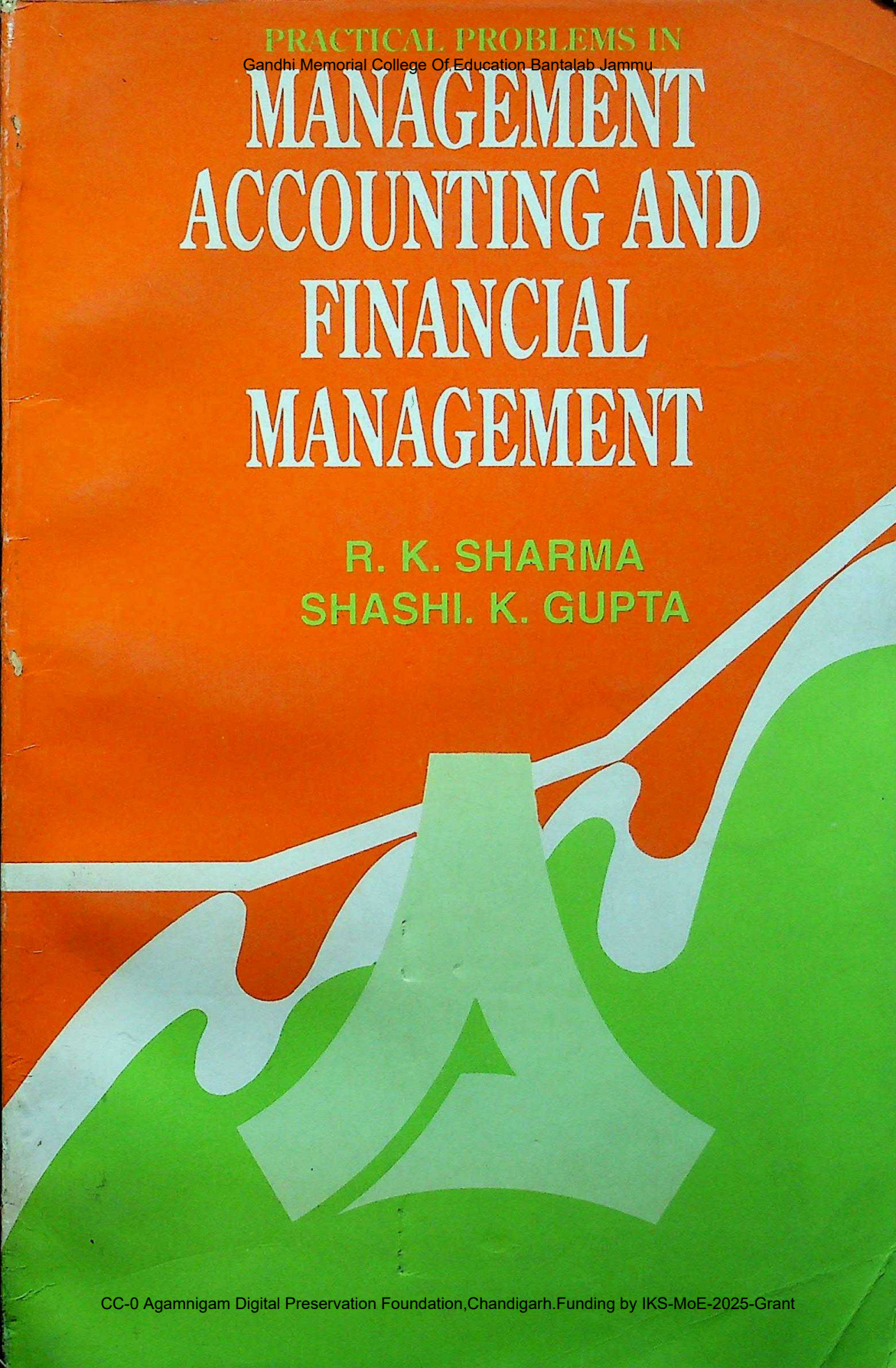
PRACTICAL PROBLEMS IN

Gandhi Memorial College Of Education Bantalab Jammu

MANAGEMENT ACCOUNTING AND FINANCIAL MANAGEMENT

R. K. SHARMA
SHASHI. K. GUPTA



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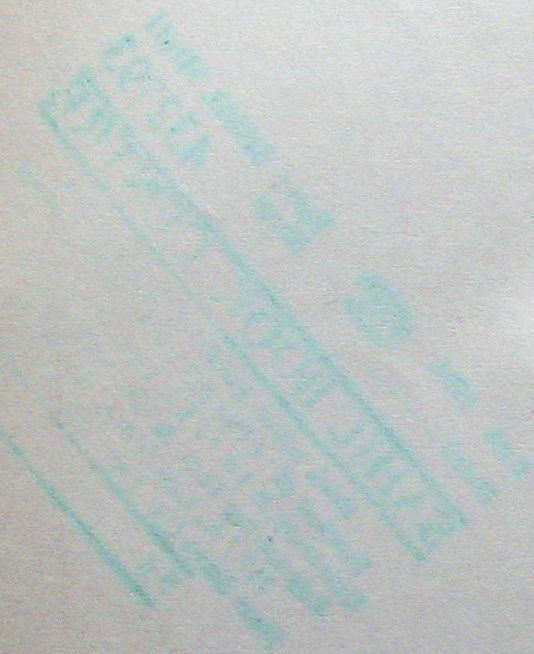

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PREFACE

(Third Edition)

We are happy to present the 3rd revised and enlarged edition of this book before the readers. While revising this edition due weightage has been given to the suggestions received from various quarters. Many new problems have been added in the book in order to acquaint the reader with the latest trend of examinations. The problems relating to Dividend Policy, Leverage, Time Value of Money, Valuation Concepts and Models, Responsibility Accounting and Lease Financing have been added for the first time.

The book in its present form will be more useful to the students appearing in B. Com., M.B.A., C.A., I.C.W.A., Company Secretaries and other professional examinations.

We shall be thankful to the readers for sending suggestions for the furhter improvement of the book.

1997

R.K.Sharma
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PREFACE

(First Edition)

This book has been written as a guide for solving various problems on Management Accounting to meet the needs of students preparing for various examinations such as B. Com., M. Com., I.C.W.A., C.S., C.A. and other professional and competitive tests. The book may also serve the purpose of the Managers engaged in the tedious task of Financial Management. The book covers various problems and their solutions on board aspects of Management Accounting. Financial Management and Cost Accounting. We have taken in view the questions set in various examinations of Indian universities and professional bodies and have prepared questions in a way so as the students do not find difficulty in solving those problems. We hope that the teachers will also find the book useful.

We are grateful to M/s Kalyani Publishers for inspiring us to bring out this book.

We shall be thankful to the readers for sending suggestions for the further improvement of the book.

R.K. Sharma
Shashi K. Gupta

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1

Financial Statements Analysis

Problem 1.1. The following are the Balance Sheets of Surindra Ltd. for the years ending 31st December, 1993 and 1994 ;

	1993 *Rs.*	1994 *Rs.*		1993 *Rs.*	1994 *Rs.*
			Fixed Assets	2,40,000	3,50,000
Equity Share Capital	2,00,000	3,30,000	(*Less* Depreciation)		
			Stock	40,000	50,000
Preference Share Capital	1,00,0000	1,50,000	Debtors	1,00,000	1,25,000
			Bills Receivables	20,000	60,000
Reserves	20,000	30,000	Prepaid Expenses	10,000	12,000
Profit and Loss A/c	15,000	20,000	Cash in hand	40,000	53,000
Bank Overdraft	50,000	50,000	Cash at Bank	10,000	30,000
Creditors	40,000	50,000			
Provision for Taxation	20,000	25,000			
Proposed Dividend	15,000	25,000			
	4,60,000	6,80,000		4,60,000	6,80,000

Prepare a Comparative Balance Sheet of the company and study its financial position.

Solution :

COMPARATIVE BALANCE SHEET OF SURINDRA LTD.

for the years ending 31st December

Assets	1993	1994	*Increase Decrease in Amount*	*Percentage Increase/ Decrease*
1	2	3	4	5
Current Assets :	*Rs.*	*Rs.*	*Rs.*	
Cash in hand	40,000	53,000	+13,000	+ 32.5
Cash at Bank	10,000	30,000	+20,000	+ 200.0
Stock	40,000	50,000	+10,000	+ 25.0
Debtors	1,00,000	1,25,000	+ 25,000	+ 25.0
Bills Receivables	20,000	60,000	+ 40,000	+ 200.0
Prepaid Expenses	10,000	12,000	+ 2,000	+ 20.0
Total Current Assets	2,20,000	3,30,000	1,10,000	+ 50.00
Fixed Assets less depreciation	2,40,000	3,50,000	1,10,000	+45.83
Total Assets	4,60,000	6,80,000	2,20,000	+ 47.82

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Liabilities and Capital :				
Current Liabilities				
Bank Overdraft	50,000	50,000	—	—
Creditors	40,000	50,000	+ 10,000	+ 25.0
Provision for taxation	20,000	25,000	+ 5,000	+ 25.0
Proposed dividend	15,000	25,000	+ 10,000	+ 66.7
Total Current Liabilities	1,25,000	1,50,000	25,000	+ 20.0
Capital & Surpluses				
Equity Share Capital	2,00,000	3,30,000	1,30,000	+ 65.0
Preference Share Capital	1,00,000	1,50,000	+ 50,000	+ 50.0
Reserves	20,000	30,000	+ 10,000	+ 50.0
Profit & Loss A/c	15,000	20,000	+ 5,000	+ 33.3
Total Liabilities	4,60,000	6,80,000	+ 2,20,000	47.82

Comments

(1) The working capital position of the company has improved a lot. In 1993 working capital (current assets – current liabilities) of the company was Rs. 95,000 and this figure was Rs. 1,80,000 in 1994 which is almost double. The liquidity position has also shown a good progress. All liquid assets have shown an increase in 1994. The cash position is also better in the later year. The current and liquid financial position of the company has considerably improved.

(2) Fixed assets have increased by Rs. 1,10,000 in 1994 as compared to 1993. The long-term funds have increased at the same figure. The equity share capital and preference share capital have been issued in 1994 to the tune of Rs. 1,80,000. The company has financed all fixed assets out of long-term funds.

(3) The reserves and profits have increased by 50% and 33% respectively. The company has increased both types of capital which will also require more profits to maintain previous rate of dividend.

(4) The current financial position of the company is satisfactory while it needs raising of more funds either in the shape of share capital or debentures. The company has shown an overall improvement.

Problem 1.2. With the help of Comparative Balance Sheet, study the financial position of Mahindra and Mahindra Ltd., Bombay for the years 1993 and 1994.

BALANCE SHEETS

for the years ending 31st December

(Rs. in '000)

Liabilities	1993 *Rs.*	1994 *Rs.*	*Assets*	1993 *Rs.*	1994 *Rs.*
6% Redeemable Cum Pref. share capital	2,500	2,500	Fixed Assets *Less* Depreciation	9,705	11,032
Investments	1,947	2,429			
6-1/2 % Redeemable Cum. Pref. Share Capital	—	3,000	*Current Assets* Receivables	1,217	1,584
			Advance Payment	1,818	500
Ordinary Share cpital	5,500	13,200	of Tax		
Reserves	2,500	3,450	Cash & Bank Balances	2,419	1,886
Profit & Loss A/c	116	99	Sundry Debtors	38,700	36,951
Loans & Advances	71,745	51,282	Stock-in-trade	52,334	36,769
Sundry creditors	27,122	14,734	Stores, spare parts		
Provision for Taxation	5,012	4,578	& tools, etc.	1,890	2,042
			Prepaid expenses	7,957	3,772

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Customers' Credit Balances	1,603	2,079			
Accruals (Interest on securties)	695	237			
Unclaimed Dividend	6	107			
Provision for proposed dividend	1,113	1,420			
Provision for contingent liability	75	81			
Provision for gratuity	—	198			
	1,17,987	96,965		1,17,987	96,965

Solution :

COMPARATIVE BALANCE SHEET OF MAHINDRA & MAHINDRA

	1993 (Rs. in '000)	*1994 (Rs. in '000)*	*Increase/ Decrease in Amount (Rs. in '000)*	*Percentage increase/ decrease*
Aseets :				
Current Assets				
Receivables	1,217	1,584	+ 367	+30.15
Advance Payment of Tax	1,818	500	– 1,318	– 72,05
Cash & Bank Balances	2,419	1,886	– 533	– 22.03
Sundry Debtors	38,700	36,951	– 1,749	– 4.51
Stock in trade	52, 334	36,769	– 15,565	– 29.74
Stores, spare parts & tools, etc.	1,890	2,042	+ 152	+8.34
Prepaid Expenses	7,957	3,772	– 4,185	–52.59
	1,06,335	83,504	–22,831	–21.47
Investments	1,947	2,429	+482	+24.75
Fixed Assets Less depreciation	9,705	11,032	+ 1,327	+13.67
Total Assets	1,17,987	96,965	–21,022	–17.82
Liabilities :				
Current Liabilities				
Sundry Creditors	27,122	14,734	–12,388	– 45.67
Provision for Taxation	5,012	4,578	–434	–8.65
Customers' Credit Balances	1,603	2,079	+476	+29.69
Accruals (Interest on securities)	695	237	–458	–65.89
Unclaimed Dividend	6	107	+101	+1683.3
Provision for Proposed Dividend	1,113	1,420	–307	+27.58
Provision for Contingent Liability	75	81	+6	+8.00
Provision for Gratuity	—	198	+198	—
Total Current Liabilities	35,626	23,434	–12,192	–34.22
Long-term Liabilities				
Loans & Advances	71,745	51,282	–20,463	–28.5
Capital & Surpluses				
6% Redeemable Pref. Share Capital	2,500	2,500	—	
Redeemable Cum. Pref. share Capital	—	3,000	+ 3,000	—
Ordinary Share Capital	5,500	13,200	+ 7,700	+ 140
Reserves	2,500	3,450	+ 950	+ 38
Profit and Loss Account	116	99	– 17	– 14.65
	10,616	22,249	+ 11,633	+ 109.58
Total of Liabilities and Capital	1,17.965	96,965	– 21,022	– 17.82

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Comments

1. Most of the current assets of the company have decreased in 1994 as compared to 1993. Cash and bank balance, sundry debtors and stock in trade have decreased to a large extent. On the current liabilities side, sundry creditors have decreased by 45.67%. The working capital position has deteriorated in 1994 but decrease in current liabilities is more than the decrease in current assets. The current financial position is quite good if we see from the angle of meeting current liabilities from current assets. The company has shown a downward trend in current assets instead of showing some upward trend.

2. Fixed assets have increased by Rs. 13,27,000 which is 13.67%. This shows that the company has undertaken expansion plans in 1994. The company has issued preference share capital in 1994 and has also increased Ordinary Share Capital substantially. The increase in capitals and reserves is much more than the increase in fixed assets and it should have improved the working capital position. Instead of improving current financial position, the company has opted to purchase more investments.

3. The profit and loss account shows that the company has reduced its profits by 14.65% in 1994. This can be due to the utilisation of profits for payment of dividend. The reserves have shown an improvement of 38% which is a plus point of the company.

4. The company has shown an overall decline in 1994 which requires an indepth analysis of managerial policies and operational activities.

Problem 1.3. The following are Income Statements of Swastik Ltd., Bombay, for the years 1993 and 1994. Prepare a Comparative Income Statement and comment on the profitability of the company.

INCOME STATEMENT

	1993 *Rs.*	1994 *Rs.*		1993 *Rs.*	1994 *Rs.*
To opening stock	85,000	2,00,000	By Sales		
To Purchases *less* returns	5,00,000	5,50,000	*less* returns	10,00,000	12,00,000
			By Closing stock	2,00,000	2,25,000
To Wages	60,000	80,000	By Income from		
To Salaries	42,000	64,000	Investments	12,000	15,000
To Rent, rates and			By Dividend		
insurance	35,000	40,000	received	5,000	7,500
To Depreciation	40,000	60,000			
To Selling expenses	12,000	12,000			
To Discount allowed	5,000	7,000			
To Loss on sale of plant	—	8,000			
To Interest paid	12,000	14,000			
To Net Profit	4,26,000	4,12,500			
	12,17,000	14,47,500		12,17,000	14,47,500

Solution :

COMPARATIVE INCOME STATEMENT

(for the years ending Dec. 31, 1993 and 1994)

	1993	*1994*	*Amount (Increase/ Decrease)*	*Percentage (Increase/ Decrease)*
	Rs.	*Rs.*		
Net Sales	10,00,000	12,00,000	+ 2,00,000	+ 20
Less Cost of Goods Sold	4,45,000	6,05,000	+ 1,60,000	+ 35.9
Gross Profit	5,55,000	5,95,000	+ 40,000	+ 5.41

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Operating Expenses :				
Salaries	42,000	64,000	+ 22,000	+ 52.38
Rent, rates and insurance	35,000	40,000	+ 5,000	+ 14.29
Depreciation	40,000	60,000	+ 20,000	+ 50.00
Selling expenses	12,000	12,000	—	—
Discount allowed	5,000	7,000	+ 2,000	+ 40.00
	1,34,000	1,83,000	+ 49,000	+ 36.56
Operating Profit	4,21,000	4,21,000	− 9,000	− 2.14
Non-Operating Income				
Income from investments	12,000	15,000	+ 3,000	+ 25
Dividend received	5,000	7,500	+ 2,500	+ 50
	17,000	22,500	+ 5,500	+ 32.35
	4,38,000	4,34,500	− 3,500	− 0.79
Non-Operating expenses				
Loss on sale of plant	—	8,000	+ 8,000	+ 100.00
Interest paid	12,000	14,000	+ 2,000	+ 16.67
	12,000	22,000	+ 10,000	+ 83.3
Net Profit	4,26,000	4,12,500	− 13,500	− 3.17
Working Notes :				
	1993	1994		
(1) Cost of goods sold :				
Opening stock	85,000	2,00,000		
Add : Purchases	5,00,000	5,50,000		
Wages	60,000	80,000		
	6,45,000	8,30,000		
Less Closing stock	2,00,000	2,25,000		
Cost of goods sold	4,45,000	6,05,000		

Comments

1. The gross profit of the company has shown an increase in 1994 as compared to the gross profit in 1993. The increase in gross profit is not commensurate with the increase in sales. The sales in 1994 have increased by 20% as compared to 1993 but cost of goods sold has increased by 38.2% in the same period. The company has not been able to keep cost of goods sold in check otherwise increased sales could be helpful in increaseing gross profit to better rate.

2. A look on operating expenses shows that salaries and depreciation have increased substantially which have increased operating expenses in the later year. The marginal increase in gross profit has been consumed by the increase in operating cost thereby resulting in decreased operating profit.

3. The non-operating expenses are less than the non-operating income in both the years but the situation in 1994 is bad as compared to 1993. Non-operating income in 1993 was more than non-operating expenses by Rs. 5000 whereas this difference decreased to Rs. 500 in 1994.

4. The company has a high rate of net profit in both the years. Net profitability is 42.6% in 1993 as compared to 34.37% in 1994. The rate of profitability is quite high in the company.

5. The overall profitability is quite satisfactory but it has shown a decreasing trend in 1994 as compared to 1993.

Problem 1.4. The Balance Sheets of a company are given as under. Explain the significance of changes in assets and liabilities of these comparative balance sheets :

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	31st March 1994	31st March 1995
Equity Share Capital	5,00,000	10,00,000
Preference Share Capital	1,00,000	2,00,000
General Reserves	1,00,000	2,50,000
Accounts Payable	1,00,000	2,00,000
Outstanding Expenses	50,000	50,000
P & L Account	2,00,000	3,00,000
	10,50,000	20,00,000
Fixed Assets	4,00,000	10,00,000
Investments	3,00,000	1,00,000
Receivables	2,00,000	4,00,000
Inventories	1,00,000	4,00,000
Cash	50,000	1,00,000
	10,50,000	20,00,000

Solution :

COMPARATIVE BALANCE SHEET

	1994	*1995*	*Increase/ Decrease (Amount)*	*Increase/ Decrease (Percentage)*
Current assets	*Rs.*	*Rs.*	*Rs.*	
Receivables	2,00,000	4,00,000	+ 2,00,000	+ 100
Inventories	1,00,000	4,00,000	+ 3,00,000	+ 300
Cash	50,000	1,00,000	+ 50,000	+ 100
Total Current Assets	3,50,000	9,00,000	+ 5,50,000	+ 157.1
Investments	3,00,000	1,00,000	– 2,00,000	– 66.67
Fixed Assets	4,00,000	10,00,000	+ 6,00,000	+ 150
Total Assets	10,50,000	20,00,000	+ 9,50,000	+ 90.47
Current Liabilities				
Accounts Payable	1,00,000	2,00,000	+ 1,00,000	100
Outstanding Expenses	50,000	50,000	—	—
Total Current Liabilities	1,50,000	2,50,000	+ 1,00,000	+ 66.6
Capital and Reserves				
Equity Share Capital	5,00,000	10,00,000	+ 5,00,000	+ 100
Preference Share Capital	1,00,000	2,00,000	+ 1,00,000	+ 100
General Reserves	1,00,000	2,50,000	+ 1,50,000	+ 150
P & L Account	2,00,000	3,00,000	+ 1,00,000	+ 50
	9,00,000	17,50,000	+ 8,50,000	+ 94.4
Total Liabilities, Capital and Reserves	10,50,000	20,00,000	+ 9,50,000	+ 90.47

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Comments

1. The working capital position of the company has considerably improved. The current assets have increased by Rs. 5,50,000 in 1995 as compared to 1994 whereas current liabilities increased only by Rs. 1,00,000 leaving a net increase of Rs. 4,50,000; cash position of the company has considerably improved in 1995.

2. Fixed assets have increased by 150% in one year's time. The company has issued fresh equity and preference share capital to purchase additional fixed assets. The company has sold investments for Rs. 2,00,000 so as to improve its working capital position.

3. The profitability of the company has gone up in 1995. Profit and loss account and general reserves have increased by 50% and 150% respectively.

4. Long-term solvency of the company has also shown an improvement. The capitals and undistributed profits are much more than the fixed assets. etc.

5. The overall financial position of the company has shown a satisfactory improvement.

Problem 1.5. The following are the Balance Sheets of a company for the years 1993 and 1994. Comment on the financial position of the business with the help of comparative balance sheet technique :

BALANCE SHEETS

(as on 31 Dec. 1993 and 1994)

	1993	1994
	Rs.	*Rs.*
Liabilities		
Preference Share Capital	5,00,000	9,00,000
Equity Share Capital	6,00,000	12,00,000
General Reserves	4,00,000	5,00,000
P & L A/c	2,00,000	2,25,000
Long-term Loans	2,00,000	10,00,000
Bills Payable	80,000	1,00,000
Outstanding Expenses	20,000	25,000
	20,00,000	39,50,000
	Rs.	*Rs.*
Assets		
Fixed Assets		
Gross Block	18,00,000	40,00,000
Less : depreciation	8,00,000	15,00,000
	10,00,000	25,00,000
Investments	3,00,000	2,00,000
Current Assets		
Bills Receivables	2,00,000	3,50,000
Inventories	4,00,000	6,00,000
Cash	1,00,000	3,00,000
	20,00,000	39,50,000

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Solution :

COMPARATIVE BALANCE SHEET

for the year ending 31st December 1993 and 1994

	1993	1994	*Increasel Decrease Amount*	*Increasel Decreass Percentage*
Fixed Assets	*Rs.*	*Rs.*	*Rs.*	
Gross Block	18,00,000	40,00,000	+ 22,00,000	+ 122.22
Less: Depreciation	8,00,000	15,00,000	+ 7,00,000	+ 87.50
Total Fixed Assets	10,00,000	25,00,000	+ 15,00,000	+ 150.00
Investments	3,00,000	2,00,000	–1,00,000	– 33.33
Current Assets				
Bills Receivables	2,00,000	3,50,000	+ 1,50,000	+ 75.00
Inventories	4,00,000	6,00,000	+ 2,00,000	+ 50.00
Cash	1,00,000	3,00,000	+ 2,00,000	+ 200.00
Total Current Assets	7,00,000	12,50,000	+5,50,000	+78.57
Total Assets (Fixed + Current)	20,00,000	39,50,000	+19,50,000	+97.50
Liabilities & Capital				
Capital & Reserves				
Preference Share Capital	5,00,000	9,00,000	+ 4,00,000	+ 80.00
Equity Share Capital	6,00,000	12,00,000	+ 6,00,000	+ 100.00
General Reserve	4,00,000	5,00,000	+ 1,00,000	+ 25.00
Profit & Loss Account	2,00,000	2,25,000	+ 25,000	+ 12.50
	17,00,000	28,25,000	+11,25,000	+ 66.18
Long-term Liabilities				
Long-term loans	2,00,000	10,00,000	+ 8,00,000	+ 400.00
Current Liabilities				
Bills Payable	80,000	1,00,000	+ 20,000	+ 25.00
Outstanding expenses	20,000	25,000	5,000	+ 25.00
Total Current Liabilities	1,00,000	1,25,000	+ 25,000	+ 25.00
Total Capital & Liabilities	20,00,000	39,50,000	+19,50,000	+ 97.50

Comments

1. The fixed assets of the company have increased by 150% in 1994 as compared to 1993. The gross value of assets increased from Rs. 18 lakhs to Rs. 40 lakhs. The increase in fixed assets has been financed by the issue of share capital and long-term loans. Preference and equity share capital increased by Rs. 100 lakhs while long-term loans were raised for a sum of Rs. 8 lakhs. Investments have also been sold for Rs. 1 lakh for expansion purposes. A considerable increase in gross block, capitals and long-term loans show that the company has taken up expansion plans in a big way.

2. The current financial position of the company has considerably improved. Total current assets increased by a sum of Rs. 5.5 lakhs while the increase in current liabilities is only to the extent of Rs. 25,000. The net working capital (current assets – current liabilities) increased from Rs. 6 lakhs to Rs. 11.25 lakhs. The company will have no problem in meeting its day-to day expenses. The increase in cash is 200% which means that the liquidity of the company has also improved.

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3. The increase in general reserve and profit and loss account balance shows that the company is more interested in ploughing back its profits than in issue of more dividend.

The short-term as well as long-term financial position of the company is sound.

Problem 1.6. Following Income Statements of a business are given for the years ending 31st Dec. 1993 and 1994. Rearrange them in a comparative form and make comments.

INCOME STATEMENTS

for the years ending on 31st December 1993 & 1994

	1993 Rs.	1994 Rs.		1993 Rs.	1994 Rs.
To Cost of goods sold	9,00,000	9,50,000	By Sales	15,25,000	17,00,000
To Administrative expenses	93,250	95,980	By Interest		
To Selling expenses	1,90,000	2,09,000	and dividend	7,500	6,200
To Interest paid	8,000	7,000	By Profit from		
To Loss on sale of machinery	2,500	800	sale of land	6,000	8,000
To Income-tax	85,000	1,68,000			
To Net Profit	2,59,750	2,83,420			
	15,38,500	17,14,200		15,38,500	17,14,200

Solution :

COMPARATIVE INCOME STATEMENT

	1993	1994	*Increase/ Decrease Amount*	*Percentage Increasen/ Decrease*
		Rs.	*Rs.*	
Sales	15,25,000	17,00,000	+1,75,000	+11.47
Less : Cost of Sales	9,00,000	9,25,000	+25,000	+2.77
Gross Profit	6,25,000	7,75,000	+1,50,000	+24.00
Operating Expenses				
Administrative Expenses	93,250	95,980	+ 2,730	+ 2.93
Seiling Expenses	1,90,000	2,09,000	+ 19,000	+ 10.00
Total Operating Expenses	2,83,250	3,04,980	+ 21,730	+ 7.67
Operating Profit	3,41,750	4,70,020	+1,28,270	+ 37.53
Non-operating Income				
Interest and Dividend	7,500	6,200	– 1,300	– 17.33
Profit from Sale of Land	6,000	8,000	+ 2,000	+ 33.33
	13,500	14,200	+ 700	+ 5.18
Total Income (operating and non-operating)	3,55,250	4,84,220	+ 1,28,970	+ 36.3
Non-operating Expenses				
Loss on Sale of Machinery	2,500	800	– 1,700	– 68.00
Income-Tax	85,000	1,68,000	+ 83,000	+ 97.64
	87,500	1,68,800	+ 81,300	+ 92.9
Net Profit	2,67,750	3,15,420	47,670	+ 17.80

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Comments

1. The increase in sales is to the extent of Rs. 1.75 lakh while cost of sales increased by a sum of Rs. 25,000. The increase in sales is much better and cost of sales has been kept under control. The gross profit has increased by 24% and it is a healthy sign.

2. The operating profit has increased by 37.53%. Whereas operating expenses increased by only 7.67%, the increase in operating expenses is just normal. The increase in selling expenses by Rs. 19,000 is justified as compared to the increase in sales *i.e.*, Rs. 1,75,000.

3. Non-operating income has increased by a small figure of Rs. 700 while non-operating expenses here increased by Rs. 81,300. In non-operating expenses, income-tax has increased by Rs. 83,000.

4. The overall profitability is good.

Problem 1.7. The comparative income statements of Oswal Industries Limited are given for the years 1993 and 1994. Analyse and interpret the significance of changes in these statements :

	31st Dec. 1993 (Rs.)	*31st Dec. 1994 (Rs.)*
Sales	9,82,400	7,27,650
Less : Discounts, returns, etc.	13,260	11,750
Net sales	9,69,140	7,15,200
Less : Cost of goods sold	6,15,460	4,35,640
Gross profit	3,53,680	2,80,260
Less : Administrative and General Expenses	70,700	53,215
Less : Selling expenses	1,78,250	1,62,440
Net operating profit	1,04,730	64,605
Less : Interest on loans	17,215	21,600
Net profit before taxes	87,515	43,005
Corporation tax	32,100	16,000
Net profit for the year	55,415	27,005

Solution :

COMPARATIVE INCOME STATEMENT

for the years 1993 and 1994

	1993	1994	*Increase/ Decrease (Amount)*	*Increase/ Decrease (Percentage)*
	Rs.	*Rs.*	*Rs.*	
Sales	7,27,650	9,82,400	+ 2,54,750	+ 35.01
Less : Discounts, returns, etc.	11,750	13,260	+ 1,510	+ 12.85
	7,15,900	9,69,140	+ 2,53,240	+ 35.373
Less : Cost of goods sold	4,35,640	6,15,460	1,79,820	+ 41.12
Gross Profit	2,80,260	3,53,680	73,420	+26.19

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Less : Administrative and General expenses	53,125	70,700	+ 17,575	+ 33.08
Selling expenses	1,62,440	1,78,250	+ 15,810	+ 9.73
Total operating expenses	2,15,565	2,48,950	+ 33,385	+15.48
Operating profit	64,605	1,04,730	+ 40,125	+ 62.108
Less : Interest on loan	21,600	17,215	– 4,485	–20.76
Net profit before tax	43,005	87,515	+ 44.510	+ 103.49
Corporation tax	16,000	32,100	+ 16,100	+ 59.06
Net Profit for the year	27,005	55,415	+ 28,410	+ 105.20

Comments

1. The net sales of the company have increased by about 35% which is quite good. The gross profit of the company has increased by Rs. 73,420 in one year's time.
2. The operating profit has considerably gone up *i.e.* by 62.108%. The increase in operating expenses is less than the increase in gross profit ; so it has helped in increasing operating profits.
3. Non-operating expenses have shown a decrease ; it has further improved profitability.
4. The net profit has increased by Rs. 28,410 *i.e.* 105.2% which is a good sign.
5. The company has a fair rate of increase in profitability.

Problem 8. From the following information, interpret the result of operations of a manufacturing concern, using trend ratios :

(Rs. lakhs)

	1992	1993	1994	1995
Sales (Net)	100	90	120	150
Less : Cost of goods sold	60	60	70	80
Gross Profit	40	30	50	70
Less : Operating expenses	10	10	15	20
Net operating profit	30	20	35	50
Less taxes	15	10	17.5	25
Profit after tax	15	10	17.5	25

Solution :

COMPARATIVE INCOME STATEMENT

(for the years ended 1992 - 1995)

Particulars	*Rs. in lakhs*				*Trend Percentage* (1992 = 100)		
	1992	1993	1994	1995	1993	1994	1995
Net Sales	100	90	120	150	90	120	150
Less : Cost of goods sold	60	60	70	80	100	117	133
Gross Profit	40	30	50	70	75	125	175
Less : Operating expenses	10	10	15	20	100	150	200
Net Operating Profit	30	20	35	50	67	117	167
Less : Taxes	15	10	17.5	25	67	117	167
Profit after tax	15	10	17.5	25	67	117	167

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Comments

The trend percentages calculated from the given information reveal the following :

1. There has been substantial increase in sales during this period except in the year 1993. The net sales have increased by 50% in 1995 as compared to 1992.

2. Though the cost of goods sold has also increased during this period by 33%, the increase in sales has been much more. This has resulted in the increase in gross profit on sales at a much higher rate than the increase in net sales.

3. Operating expenses have increased at a much higher rate than increase in net sales during this period. The operating expenses have increased by100% in 1995 as compared to 50% increase in sales. This increase in operating expenses has adversely affected the increase in the rate of net operating profit. The net operating profit has increased by only 67% while the gross profit had increased by 75%. Thus, the operating expenses should be kept under control.

4. The overall growth of the firm is satisfactory as the net sales as well as net operating profit and profit after tax have increased substantially.

Problem 1.9. Convert the following Balance Sheets into common size Balance Sheet and interpret the results :

BALANCE SHEETS

as on 31st December 1994 and 1995

Liabilities	1994 *Rs.*	1995 *Rs.*	*Assets*	1994 *Rs.*	1995 *Rs.*
Equity Share Capital	1000	1,200	*Current Assets :*		
Capital Reserves	90	185	Debtors	450	390
General Reserves	500	450	Cash	200	15
Sinking Fund	90	100	Stock	320	250
Debentures	450	650	Investments	300	250
Sundry creditors	200	150	*Fixed Assets :*		
Others	15	20	Building less depreciation	800	1,400
			Land	198	345
			Furniture and Fixtures	77	105
	2,345	2,755		2,345	2,755

Solution : **COMMON SIZE BALANCE SHEETS**

as on 31st December 1994 and 1995

Liabilities	1994 *Rs.*	1995 *Rs.*	*Assets*	1994 *Rs.*	1995 *Rs.*
Current Liabilities			*Current Assets*		
Sundry creditors	8.53	5.44	Debtors	19.19	14.16
Others	0.64	0.70	Cash	8.53	0.54
			Stock	13.65	9.07
Total	9.17	6.14			
Fixed Liabilities			Total	41.37	23.77
Debentures	19.19	23.60	Investments	12.80	9.07
Capital			*Fixed Assets*		
Equity Share Capital	42.64	43.58	Land	8.44	12.52
			Building	34.11	50.82
Capital Reserve	3.84	6.72	Furniture and		
General Reserves	21.32	16.33	Fixtures	3.28	3.82
Sinking Fund	3.84	3.63			
	100.00	100.00		100.00	100.00

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Interpretation

1. Both current assets and current liabilities have decreased in 1995 as compared to 1994. The decrease in current assets is more than the decrease in current liabilities while current liabilities have decreased only by 3.03% whereas current assets have gone down from 41.37% to 23.77%. Though current assets fully cover current liabilities but this decrease is alarming. All current assets have gone down but cash has decreased to a considerable extent. It is only 0.54% in 1995 while it was 8.53% of total assets a year earlier. The concern is likely to face problems in meeting day to day expenses.

2. Fixed assets and fixed liabilities have both increased in 1995 but increase in fixed assets is more than the increase in fixed liabilities. The business has increased capital and debentures to finance the addition of fixed assets. Investments have also been sold to provide funds for purchasing fixed assets. All these sources put together are less than the increase in fixed assets and it is clear that current funds have also been used to purchase fixed assets. A right approach is to finance fixed assets by raising long-term funds and current assets should be kept for working capital purposes only. In this case the concern has not followed a proper financial policy.

3. The purchase of land and building shows that the concern has undetaken expansion plans and capacity will go up in the following years.

The overall financial position of the business is good at present but current assets especially cash need augmentation.

Problem 1.10. Following are the Balance Sheets of Sansar Industries Ltd. for the years ending Dec. 31 1994 and 1995.

Liabilities	*1994* Rs.	*1995* Rs.	*Assets*	*1994* Rs.	*1995* Rs.
Equity Share Capital	4,00,000	6,00,000	Land & Buildings	2,70,000	1,70,000
Reserves & Surplus	3,12,000	3,54,000	Plant & Machinery	3,10,000	7,86,000
Debentures	50,000	1,00,000	Furniture & Fixtures	9,000	18,000
Long-term loans on Mortgage	1,50,000	2,55,000	Other Fixed Assets	20,000	30,000
Accounts Payable	2,55,000	1,17,000	Long-term Loans	46,000	59,000
Other Current Liabilities	7,000	10,000	Cash in hand and at Bank	1,18,000	10,000
			Receivables	2,09,000	1,90,000
			Inventory	1,60,000	1,30,000
			Prepaid Expenses	3,000	3,000
			Other Current Assets	29,000	40,000
	11,74,000	14,36,000		11,74,000	14,36,000

Analyse the financial position of the company with the help of common size Balance Sheet. (For solution see next page)

Comments

1. The current assets have decreased in 1995 as compared to 1994 both in absolute figures and in terms of percentage of total assets. Cash in hand and at bank is only 0.69% of total assets in 1995 whereas it was 10.05% a year earlier. There is a decline in receivables and inventory too. It shows that current financial position has gone down. There is a slight decrease in accounts payable but current assets have decreased more which shows that working capital position is bad in 1995 as it was in 1994.

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2. The company has issued more capital in 1995 and has issued more debentures too. The additional finances raised by the company have been used to purchase plant and machinery. Plant and machinery is more than half (54.73%) of total assets whereas it was 26.4% in 1994. The company has increased its production capacity in 1995. The decrease in land and building is not consistent with the increase in other fixed assets. Long-term loans have also been raised to increase production capacity.

3. Reserves and surplus have increased in absolute figures but it has shown a decrease as a percentage of total assets. Profitability has increased only marginally but investments increased substantially. It shows that profitability has not increased as yet and it will take some more time to show profitability.

4. Liquidity position of the company is not good. It should improve its working capital position.

COMMON SIZE BALANCE SHEET FOR THE YEARS ENDING

for the Years Ending Dec., 31, 1994 and 1995

Liabilities	*1994*	*Percentage*	*1995*	*Percentage*	*Assets*	*1994*	*Percentage*	*1995*	*Percentage*
	Rs.		*Rs.*			*Rs.*		*Rs.*	
Equity Share Capital	4,00,000	34.07	6,00,000	41.78	Land and Buildings	2,70,000	22.99	1,70,000	11.84
Reserves and surplus	3,12,000	26.57	3,54,000	24.65	Plant and Machinery	3,10,000	26.41	7,86,000	54.73
Debentures	50,000	4.26	1,00,000	6.96	Furniture and Fixtures	9,000	0.76	18,000	1.25
Long-term loans on Mortgage	1,50,000	12.78	2,55,000	17.76	Others Fixed Assets	20,000	1.70	30,000	2.09
Accounts Payable	2,55,000	21.72	1,17,000	8.15	Long-term Loans	46,000	3.91	59,000	4.13
Other Current Liabilities	7,000	0.60	10,000	0.70	Cash in hand and at Bank	1,18,000	10.5	10,000	0.69
					Receivables	2,09,000	17,80	1,90,000	13.23
					Inventory	1,60,000	13.63	1,30,000	9.05
					Prepaid Expenses	3,000	0.28	3,000	0.21
					Other Current Assets	29,000	2.47	40,000	2.78
	11,74,000	100.00	14,36,000	100.00		11,74,000	100.00	14,36,000	100.00

Problem 1.11. The following are the Balance Sheets of a Company for the years 1993 and 1994. Discuss the financial position of the company in two years with the help of common-size balance sheet.

BALANCE SHEET

as at 31st December

Liabilities	*1993* Rs.	*1994* Rs.	*Assets*	*1993* Rs.	*1994* Rs.
Share Capital	5,25,000	5,75,000	Goodwill	85,000	5,000
Reserves	2,52,000	2,52,000	Plant and Equipment,		
Surplus	1,75,535	59,070	etc.	4,26,000	4.13,000
6% Debentures	1,25,000	1,00,000	Patents	30,000	24,000
Accrued interest			Investments	1,05,000	25,000
on debentures	3,750	3,000	Cash and Bank	1,70,650	2,87,800
Sundry Creditors	1,12,000	1,43,000	Sundry Debtors	1,38,760	1,53,000
Dividend Payable	—	25,000	Inventories	2,35,800	2,87,670
Taxation Provision	8,000	48,000	Prepaid Expenses	3,200	4,600
			Debentures Discount	6,875	5,000
	12,01,285	12,05,070		12,01,285	12,05,070

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Solution :

COMMON SIZE BALANCE SHEET

for the years 1993 and 1994

Liabilities	*1993 Rs.*	*Percen-tage*	*1994 Rs.*	*Percen-tage*	*Assets*	*1993 Rs.*	*Percen-tage*	*1994 Rs.*	*Percen-tage*
Share Capital	5,25,000	43,73	5,75,000	47,72	Goodwill	85,000	7.07	5,000	0.41
Reserves	2,52,000	20.97	2,52,000	20.91	Plant and				
Surplus	1,75,535	14.06	59,070	4.91	Equipment etc.	4,26,000	35.46	4,13,000	34.29
6% Debentures	1,25,000	10.04	1,00,000	8.29	Patents	30,000	2.49	24,000	1.99
Accrued Interest	3,750	0.31	3,000	0.25	Investments	1,05,000	8.74	25,000	2.08
Sundry Creditors	1,12,000	9.32	1,43,000	11.87	Cash and Bank	1,70,650	14.21	2,87,800	23.88
Dividend Payable	—	—	25,000	2.07	Sundry Debtors	1,38,760	11.55	1,53,000	12.68
Taxation Provision	8,000	0.67	48,000	3.98	Inventories	2,35,800	19.63	2,87,670	23.88
					Prepaid Expenses	3,200	0.27	4,600	0.38
					Debenture Discount	6,875	0.58	5,000	0.41
	12,01,285	100.00	12,05,070	100.00		12,01,285	100.00	12,05,070	100.00

Comments

The capital structure of the company shows that it has relied more on its own funds than on outsiders' funds. In other sense one can say that the company is traditionally financed. The share capital of the company has gone up in 1994 which shows that company does not believe in borrowing. The decrease in surplus indicates the issue of dividend in 1994. The increase in taxation provision from 0.67% to 3.98% is rather abnormal.

The investment in plant and equipment is over one-third of total investments in both the years which is a good sign because production capacity entirely depends upon such assets. The writing off of goodwill in one year' time is good and indicates a healthy profitability position of the company. The cash in hand and at bank has substantially increased which has improved the liquidity position of the concern.

The overall financial structure of the company is good.

Problem 1.12. The following figure relate to the activities of SK Ltd. New Delhi for the year ending 31st March, 1995.

	Rs.
Sales	7,50,000
Purchases	3,75,000
Opening Stock	70,000
Closing Stock	80,000
Administrative Expenses :	
Salaries	37,000
Rent	12,000
Postage and stationery	5,000
Provision for taxation	50,000
Selling and Distributive Expenses :	
Salaries	18,000
Advertising	6,000
Commission on sales	7,500
Discount	2,000

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Non-Operating Expenses :

Interest	5,000
Loss of sale of Assets	11,500

Non-Operating Income :

Profit on sale of investments	9,500

You should study the Income Statement of the concern with the help of common-size statement.

Solution :

COMMON-SIZE INCOME STATEMENT

for the year ending March 31, 1995

		Amount Rs.	*Percentage Rs.*
Sales		7,50,000	100.00
Less : Cost of goods sold			
Opening stock	70,000		
Add : Purchases	3,75,000		
	4,45,000		
Less : Closing stock	80,000	3,65,000	48.67
Gross Profit		3,85,000	51.33
Less : Operating Expenses			
Administrative Expenses :			
Salaries		37,000	4.93
Rent		12,000	1.60
Postage and Stationery		5,000	0.66
Provision for taxation		50,000	6.67
		1,04,000	13.86
Selling and Distributive expenses :			
Salaries		18,000	2,40
Advertising		7,500	1.00
Commission on sales		7,500	1.00
Discount		2,000	0.13
		33,500	4.33
Total Operating expenses		1,37,500	18.19
Operating Income		2,47,500	33.14
Add Non-Operating Income			
Profit on sale of Investments		9,500	1.27
		2,57,000	34.41
Less Non-Operating Expenses			
Interest		5,000	0.67
Loss on sale of assets		11,500	1.53
		16,500	2.20
Net Profit		2,40,500	32.21

The cost of goods sold being 48.67% of sales is quite reasonable leaving 51.33% as gross profit. The operating expenses are 18.19% of sales and non-operating are 1.53% which shows that various expenses are quite under control. Operating profit of Rs. 2,57,000 which is 34.4% is satisfactory. The net profit of 32.21% is on the high side and the company is able to keep various expenses under control. The overall profitability of the company is good.

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Problem 1.13. Common-size Balance Sheet and Income Statement of two companies are given as under, you should study the comparative financial position of the companies :

COMMON SIZE BALANCE SHEET

as on 31st December, 1995

(Rs. in Thousands)

	Eagle Co. Ltd		*Sunrise Co. Ltd.*	
	Amount	*Per cent of total*	*Amount Rs.*	*Per cent of total*
Current Assets	*Rs.*		*Rs.*	
Cash	20	2.22	42	3.80
Sundry Debtors	200	22.22	190	17.28
Closing Stock	120	13.33	150	13.66
Prepaid Expenses	15	1.67	25	2.27
Other Current Assets	25	2.78	35	3.18
Total current Assets	380	42.22	442	40.19
Fixed Assets after Depreciation	520	57.78	658	59.81
Total Assets	900	100.00	1100	100.00
Liabilities and Capital				
Current Liabilities				
Sundry Creditors	55	6.1	155	14.09
Other Current Liabilities	65	7.2	75	6.81
Total Current Liabilities	120	13.3	230	20.90
Fixed Liabilities	130	14.4	170	15.46
Total Liabilities	250	27.7	400	36.36
Capital	650	72.3	700	63.64
Total Liabilities and Capital	900	100.0	1100	100.00

COMMON-SIZE INCOME STATEMENT

for the year ending 31st December 1995

(Rs. in Thousands)

	Amount Rs.	*Percen-tage of Sales*	*Amount Rs.*	*Percen-tage of Sales*
Sales less returns	1,070	100.00	1,320	100.00
Cost of goods sold	620	57.94	850	64.39
Gross Profit	450	42.06	470	35.61
Office and administrative expenses	84	7.85	90	6.81
Seilling and distributive expenses	250	23.36	190	14.40
Total operating expenses	334	31.21	280	21.21
Operating profit	116	10.85	190	14.40
Other Incomes	20	1.87	30	2.27
	136	12.72	220	16.67
Non-Operating expenses	24	2.24	26	1.97
Income before tax	112	10.48	194	14.70
	37	3.46	65	4.92
Net Income after tax	75	7.02	129	9.78

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Comments

1. The working capital position of both the companies is satisfactory but it is better in Eagle Co. Ltd. as compared to Sunrise Co. Ltd. The cash position in the first company is not good. Cash is only 2.22% in this company in comparison to 3.8% in the second company. Total current assets are slightly more in the Eagle Co. Ltd. and its current liabilities are 13.3% as compared to 20.9% in the other company and it is because of this reason that current financial position is comparatively better in the first company.

2. The first company is traditionally financed, relying more on its own funds than depending on outsiders. In the first company, 72.3% of total investments is contributed by shareholders whereas this share is 63.64% in the second company. At present, the trend is to get more and more funds from outside sources. In this case both companies have fairly good capital structure and both have raised their own sources.

3. The gross profit percentage is better in first company whereas net profit percentage is more in the second company. In Eagle Co. Ltd., cost of goods sold is 57.94% as compared to 64.39% in Sunrise Co. Ltd. but operating expenses are more in the former as compared to the later. The reason for better operating profits in the latter company, despite of low gross profit, is that selling and distributive expenses are much lower here. The former company needs a control over selling and distributive expenses. Non-operating income is more in Sunrise Co. Ltd which has also improved its net profit position.

4. The overall financial position is better in Eagle Co. Ltd., whereas profitability is comparatively better in Sunrise Co. Ltd.

Problem 1.14. Following are the Balance Sheets of Zim and Co. and Zumy and Co. as on 31.12.1993

Assets	*Zim and Co.*	*Zumy and Co.*
	Rs.	*Rs.*
Land and Building	80,000	1,20,000
Plant and Machinery	3,00,000	6,25,000
Investments	1,00,000	2,00,000
Stock	1,50,000	2,00,000
Sundry Debtors	1,00,000	1,20,000
Cash and Bank Balances	70,000	1,35,000
Total	8,00,000	14,00,000
Liabilities		
Equity share capital	2,00,000	3,00,000
12% Debentures	1,00,000	2,00,000
10% Preference share capital	2,00,000	2,50,000
Reserves and surplus	1,00,000	1,20,000
Dividend provision	50,000	70,000
Sundry Creditors	1,50,000	4,10,000
Bank O.D.	—	50,000
	8,00,000	14,00,000

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Compare the financial position of the two companies with the help of common size Balance Sheets and comment.

Solution.

COMMON-SIZE BALANCE SHEET

Assets	*Zim & Co.*		*Zumy & Co.*	
Fixed Assets	Amount Rs.	%	Amount Rs.	%
Land and Building	80,000	10.0	1,20,000	8.57
Plant and Machinery	3.00.000	37.5	6.25.000	44.64
Total Fixed Assets	3.80.000	47.5	7.45.000	53.21
Investments	1.00.000	12.5	2.00.000	14.28
Current Assets				
Stock	1,50,000	18.75	2,00,000	14.28
Sundry Debtors	1,00,000	12.5	1,20,000	8.57
Cash and Bank Balances	70.000	8.75	1.35.000	9.64
Total Current Assets	3.20.000	40.0	4.55.000	32.49
Total Assets	8.00.000	100	14.00.000	100.00
Liabilities				
Capital & Reserves				
Equity Share Capital	2,00,000	25.0	3,00,000	21.43
10% Preference share capital	2,00,000	25.0	2,50,000	17.86
Reserves and Surplus	1.00.000	12.5	1.20.000	8.57
	5.00.000	62.5	6.70.000	47.86
Long-term Loans				
12% Debentures	1.00.000	12.5	2.00.000	14.28
Current Liabilities & Provisions				
Dividend Provision	50,000	6.25	70,000	5.0
Sundry Creditors	1,50,000	18.75	4,10,000	29.28
Bank O.D.	—	—	50.000	3.57
	2.00.000	25.0	5.30.000	37.85
Total of Liabilities side	8.00.000	100.0	14.00.000	100.0

Comments

1. The common-size balance sheets of Zim & Co. and Zumy & Co. show that the former company is more traditionally financed. Zim & Co. has 62.5% funds belonging to shareholders while this figure is 47.86% in case of Zumy & Co. Zim Z & Co. has relied more on internal financing. Even long-term loans are also less (12.5%) in this company as compared to that of Zumy & Co. which are 14.28% (debentures in present case).

2. Fixed assets have been financed from long-term funds in both the companies. In Zim & Co. fixes assets are Rs. 3,80,000 while long-term funds are Rs. 6,00,000. In Zunmy & Co. fixed assets are Rs. 7,45,000 while long-term funds are Rs. 8,70,000. The best policy of financing is to purchase fixed assets from long-term funds. Both the companies have followed this policy but Zim & Co. has much more long-term funds as compared to that of Zumy & Co.

3. The current financial position of Zumy & Co. is unsatisfactory because it has more current liabilities (Rs. 5,30,000) than current assets (Rs. 4,55,000). Normally current assets should be double than current liabilities and in such a situation short-term liabilities can be easily paid. According to this yard stick even Zim & Co. also fails. It has 40% amount in current assets while current liabilities are 25%. Though comparative current financial position of Zim & Co. is better but this position is not satisfactory in both the companies.

4. The overall position of Zim & Co. is better as compared to that of Zumy & Co. but Zim & Co. should improve its current assets position.

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Problem 15. The Balance Sheets of Srividya Ltd. for the year 1992 and 1993 are given below :

BALANCE SHEETS

Liabilities	31.12.1992 *Rs.*	31.12.1993 *Rs.*
Equity share capital	6,00,000	12,00,000
10% Preference share capital	5,00,000	9,00,000
Reserve Fund	4,00,000	5,00,000
Profit and Loss A/c	2,00,000	3,00,000
Long term Loans	2,00,000	5,00,000
Creditors	1,00,000	3,00,000
Total	20,00,000	37,00,000
Assets		
	Rs.	*Rs.*
Fixed Assets (Gross Block)	15,00,000	28,00,000
Less : Depreciation	5,00,000	8,00,000
	10,00,000	20,00,000
Investments	4,00,000	5,00,000
Inventories	4,50,000	6,50,000
Accounts Receivables	1,00,000	4,00,000
Cash	50,000	1,50,000
Total	20,00,000	37,00,000

You are required to comment on the financial position of the business with the help of comparative Balance Sheet teachnique.

Solution :

COMPARATIVE BALANCE SHEET OF SRIVIDYA LTD.

	1992	1993	Increase/ Decrease	
			Amount *Rs.*	*Percentage*
Assets				
Fixed Assets				
Gross Block	15,00,000	28,00,000	13,00,000	+ 86.67
Less Depreciation	5,00,000	8,00,000	3,00,000	+ 60.0
Net Fixed Assets	10,00,000	20,00,000	+ 10,00,000	+ 100.0
Investments	4,00,000	5,00,000	+ 1,00,000	+ 25.0
Current Assets				
Inventories	4,50,000	6,50,000	+ 2,00,000	+ 44.4
Accounts Receivables	1,00,000	4,00,000	+ 3,00,000	+ 300.0
Cash	50,000	1,50,000	+ 1,00,000	+ 200.0
Total Current Assets	6,00,000	12,00,000	+ 6,00,000	+ 100.0
Total Assets	20,00,000	37,00,000	+ 17,00,000	+ 85.0
Capital & Liabilities				
Share Capital & Reserves				
Equity Share Capital	6,00,000	12,00,000	+ 6,00,000	+ 100.0
10% Preference Share Capital	5,00,000	9,00,000	+ 4,00,000	+ 80.0
Reserve Fund	4,00,000	5,00,000	+ 1,00,000	+ 25.0
Profit and Loss A/c	2,00,000	3,00,000	+ 1,00,000	+ 50.0
	17,00,000	29,00,000	+ 12,00,000	+ 70.58
Long-terms Loans	2,00,000	5,00,000	+ 3,00,000	+ 150.0
Current Liabilities				
Creditors	1,00,000	3,00,000	+ 2,00,000	+ 200.0
Total of Liabilities side	20,00,000	37,00,000	+ 17,00,000	+ 85.0

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Comments

1. The current assets have increased by Rs. 6,00,000 in 1993 as compared to 1992 and current liabilities increased by Rs. 2,00,000 in the same period. It shows that current financial position of the company has substentially improved. The current assets in 1993 are three times than the current liabilities and there will be no problem in meeting current liabilities. Among the current assets, cash and accounts receivable have increased by 200% and 300% respectively while inventories have increased by 44%. It shows that turnover of the company may be much more in 1993 as compared to 1992.

2. Fixed assets have increased by Rs. 13,00,000 in 1993 while long-term funds have gone up by Rs. 15,00,000 which shows that are these assets have been financed from long-term funds. The company has issued equity capital of Rs. 6,00,000 in 1993 which is double than that of 1992 and preference capital increased by Rs. 4,00,000. The company has undertaken some expansion or diversification programme in 1993.

3. There is a satisfactory increase in reserves and profits in one year period. The reserve increased by 25% while profits have gone up by 50%. Though profits have increased less as compared to increase in both types of capitals but the results of expansions etc. are realised in a number of years.s

4. The overall financial position of the company is good. It has shown a good progress in one year period.

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2

Ratio Analysis

SUMMARY OF RATIOS

Objective of Analysis	*Ratios to be computed*	*Basic Components*
(1)	*(2)*	*(3)*
(a) Short-term Financial Position or Test of Liquidity	1. Current Ratio	$\frac{\text{Current Assets}}{\text{Current Liabilities}}$
	2. Quick or Acid Test or Liquid Ratio (for immediate solvency)	$\frac{\text{Liquid/Quick Assets}}{\text{Current/Quick Liabilities}}$
	3. Absolute Liquid Ratio	$\frac{\text{Absolute Liquid Assets}}{\text{Current Liabilities}}$
(b) Current Asssets Movement or Efficiency or Activity Ratios	1. Inventory/Stock Turnover Ratio	$\frac{\text{Cost of Goods sold}}{\text{Average Inventory at Cost}}$
	2. Debtors or Receivables Turnover Ratio/Velocity	$\frac{\text{Net Credit Annual Sales}}{\text{Average Trade Debtors}}$
	3. Average Collection Period	$\frac{\text{Total Trade Debtors}}{\text{Net Credit Sales per day}}$
	4. Creditors/Payables Turnover Ratio/Velocity	$\frac{\text{Net Credit Annual Purchases}}{\text{Average Trade Creditors}}$
	5. Average Payment Period	$\frac{\text{Total Trade Creditors}}{\text{Average Daily Purchases}}$
	6. Working Capital Turnover Ratio	$\frac{\text{Cost of Sales}}{\text{Net Working Capital}}$
(c) Analysis of Long-term Financial Position or Test of Solvency	1. Debt–Equity Ratio	$\frac{\text{Outsiders' Funds}}{\text{Shareholders' Funds}}$ or $\frac{\text{External Equities}}{\text{Internal Equities}}$
	2. Funded Debt to Total Capitalisation Ratio	$\frac{\text{Funded Debt}}{\text{Total Capitalisation}} \times 100$

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(1)	(2)	(3)
	3. Ratio of Long-term Debt to Shareholders' Funds (Debt-Equity)	$\frac{\text{Long-term Debt}}{\text{Shareholders' Funds}}$
	4. Proprietory or Equity Ratio	$\frac{\text{Shareholders' Funds}}{\text{Total Assets}}$
	5. Solvency Ratio	$\frac{\text{Total Liabilities to Outsiders}}{\text{Total Assets}}$
	6. Fixed Assest Net Worth Ratio	$\frac{\text{Fixed Assets (after depreciation)}}{\text{Shareholders' Funds}}$
	7. Fixed Assets Ratio or Fixed Assets to Long-term Funds	$\frac{\text{Fixed Assets (after dep.)}}{\text{Total Long-term Funds}}$
	8. Ratio of Current Assets to Proprietors Funds	$\frac{\text{Current Assets}}{\text{Shareholders' Funds}}$
	9. Debt-Service, or Interest Coverage Ratio	$\frac{\text{Net Profit (before interest \& taxes)}}{\text{Fixed Interest Charges}}$
	10. Total Coverage, or Fixed-Charge Coverage	$= \frac{\text{EBIT}}{\text{Total Fixed Charges}}$
	11. Preference Dividend Coverage Ratio	$= \frac{\text{Net Profit (after interest \& income tax)}}{\text{Preference Dividend}}$
	12. Cash to Debt-Service Ratio	$\frac{\text{Annual cash flow (before interest \& taxes}}{\text{Interest} + \frac{\text{Sinking fund approp.}}{1 - \text{Tax Rate}}}$
	or Debt Cash Flow Coverage	$= \frac{\text{CF}}{\text{I} + \frac{\text{SFD}}{1 - \text{T}}}$
(d) Analysis of Profitability	1. Gross Profit Ratio	$\frac{\text{Gross Profit}}{\text{Net Sales}} \times 100$
(i) General Profitability	2. Operating Ratio	$\frac{\text{Operating Cost}}{\text{Net Sales}} \times 100$
	3. Expense Ratio	$\frac{\text{Particular Expense}}{\text{Net Sales}} \times 100$
	4. Net Profit Ratio	$\frac{\text{Net Profit after tax}}{\text{Net Sales}} \times 100$
	5. Operating Profit Ratio	$\frac{\text{Operating Profit}}{\text{Net Sales}} \times 100$

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(1)	(2)	(3)
(ii) Overall Profitability	1. Return on Share-holders' Investments or Net Worth (R.O.I.)	$\frac{\text{Net Profit (after interest \& tax)}}{\text{Shareholders' Funds}} \times 100$
	2. Return on Equity Capital	$\frac{\text{Net Profit after tax} - \text{Preference Div.}}{\text{Paid-up Equity Capital}} \times 100$
	3. Earnings Per Share (E.P.S.)	$\frac{\text{Net Profit after tax and Preference Div}}{\text{Number of Equity Shares}}$
	4. Return on Gross Capital Employed	$\frac{\text{Adjusted Net Profit}}{\text{Gross Capital Employed}} \times 100$
	5. Return on Net Capital Employed	$\frac{\text{Adjusted Net Profit}}{\text{Net Capital Employed}} \times 100$
	6. Capital Turnover Ratio	$\frac{\text{Sales or Cost of Sales}}{\text{Capital Employed}}$
	7. Dividend Yield Ratio	$\frac{\text{Dividend Per Share}}{\text{Market value per share}}$
	8. Dividend Pay-out Ratio or Pay-out Ratio	$\frac{\text{Dividend per Equity Share}}{\text{Earnings per Share}}$
	9. Price-Earning Ratio (P/E Ratio)	$\frac{\text{Market Price per Equity Share}}{\text{Earnings per Share}}$
(e) Analysis of Capital Structure or Leverage	1. Capital Gearing Ratio	$\frac{\text{Eq. Share Capital + Reserves \& Surplus}}{\text{Pref. Capital + Long-term debt bearing fixed interest}}$
	2. Total Investment to Long-term Liabilites	$\frac{\text{Shareholders' funds + Long-term Liabilities}}{\text{Long-term Liabilities}}$
	3. Debt Equity Ratio	$\frac{\text{Outsiders' Funds}}{\text{Shareholders' Funds}}$
	4. Ratio of Fixed Assets to Funded Debt	$\frac{\text{Fixed Assets}}{\text{Funded Debt}}$
	5. Ratio of Current Liabilities to Proprietors' Funds	$\frac{\text{Current Liabilities}}{\text{Shareholders' Funds}}$
	6. Ratio of Reserves to Equity Capital	$\frac{\text{Reserves}}{\text{Equity Share Capital}} \times 100$
	7. Financial Leverage	$\frac{\text{Earning Before Int. \& Tax (EBIT)}}{\text{EBIT} - \text{Inter \& Preference Dividend}}$
	8. Operating Leverage	$\frac{\text{Contribution}}{\text{EBIT}}$

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Problem 2.1. Following is the Balance Sheet of X & Co. as in 30-6-95

Liabilities	*Rs.*	*Assets*		*Rs.*
Equity Share of Rs. 10 each	1,00,000	Goodwill		50,000
Reserves	25,000	Fixed Assets		1,50,000
Profit & Loss A/c.	40,000	Stock		40,000
Secured Loan	70,000	Sundry Debtors	50,000	
Sundry Creditors	50,000	Less Reserve for	1,000	
Bank overdraft	30,000	doubtful debts		49,000
Provision for taxation	20,000	Advances		10,000
		Bank Balance		20,000
		Cash in hand		16,000
	3,35,000			3,35,000

Calculate :

(i) Current Ratio

(ii) Liquid Ratio

(iii) Absolute Liquid Ratio

Solution :

(i) Current Ratio $= \dfrac{\text{Current Assets}}{\text{Current Liabilities}}$

Current Assets = Rs. 40,000 + 49,000 + 10,000 + 20,000 + 16,000
= Rs. 1, 35, 000

Current Liabilities = Rs. 50,000 + 30,000 + 20,000
= Rs. 1, 00,000

Current Ratio $= \dfrac{1,35,000}{1,00,000} = 1.35$

(ii) Liquid Ratio $= \dfrac{\text{Liquid Assets}}{\text{Current Liabilities}}$

Liquid Assets = Current Assets – Stocks – Prepaid Expenses
= Rs. 1,35,000 – 40,000 – 0
= Rs. 95,000

Liquid Ratio $= \dfrac{95,000}{1,00,000} = 0.95$

Note : If bank overdraft is excluded from current/liquid liabilities, then Liquid Ratio shall be $\dfrac{95,000}{70,000} = 1.357$

(iii) Absolute Liquid Ratio $= \dfrac{\text{Absolute Liquid Assets}}{\text{Current Liabilities}}$

Absolute Liquid Assets = Cash in hand + Cash at bank
= Rs. 16,000 + 20,000
= Rs. 36,000

Absolute Liquid Ratio $= \dfrac{36,000}{1,00,000} = 0.36$

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Problem 2.2 Following is the Balance Sheet of Sunshine Ltd. for the year ending Dec. 31, 1994 :

BALANCE SHEET

Labilities	*Rs.*	*Assets*	*Rs.*
Equity Share Capital	5,00,000	Land and Building	3,50,000
5% Debentures	2,00,000	Plant and Machinery	2,50,000
Bank Loan	1,50,000	Cash in hand	25,000
Sundry Creditors	75,000	Cash at bank	55,000
Bills Payables	50,000	Sundry Debtors	85,000
Outstanding Expenses	5,000	Bills Receivables	1,05,000
		Stocks	1,00,000
		Prepaid Expenses	10,000
	9,80,000		9,80,000

From the information given above, calculate :

(i) *(a)* Current ratio *(b)* Acid-test ratio *(c)* Absolute liquid ratio

(ii) Comment on the short-term financial position.

Solution :

(i) *(a)* $\text{Current Ratio} = \frac{\text{Current Assets}}{\text{Current Liabilities}}$

Current Assets = Rs. 25,000 + Rs. 55,000 + Rs. 85,000 + Rs. 1,05,000 + Rs. 1,00,000 + Rs. 10,000 = Rs. 3,80,000

Current Liabilities = Rs. 75,000 + Rs. 50,000 + Rs. 5,000 = Rs. 1,30,000

$$\text{Current Ratio} = \frac{\text{Rs. 3,80,000}}{\text{Rs. 1,30,000}} = 2.92.$$

(b) $\text{Acid-test Ratio} = \frac{\text{Liquid Assets}}{\text{Current Liabilities}}$

Liquid Assets = Stocks and prepaid expenses should be deducted from total current assets.

= Rs. 3,80,000 – Rs. 1,00,000 – Rs. 10,000

= Rs. 2,70,000

$$\text{Acid-test Ratio} = \frac{\text{Rs. 2,70,000}}{\text{Rs. 1,30,000}} = 2.076$$

(c) $\text{Absolute Liquid Ratio} = \frac{\text{Absolute Liquid Assets}}{\text{Current Liabilities}}$

Absolute Liquid Assets = Cash-in-hand + Cash -at-bank

= Rs. 25,000 + Rs. 55,000

= Rs. 80,000

$$\text{Absolute Liquid Ratios} = \frac{\text{Rs. 80,000}}{\text{Rs. 1,30,000}} = 0.615$$

(ii) **Comments :** Short-term financial position of the concern is quite satisfactory.

Note : Bank-loan is a long-term liability.

Problem 2.3. From the following particulars pertaining to the current assets and current liabilities given in the comparative Balance Sheets of Progressive Co. Ltd, you are required to comment on the liquid position of the Company with the help of the accounting ratios :

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Liabilities	*1995*	*1996*	*Assets*	*1995*	*1996*
Sundry Creditors	5,00,000	6,00,000	Inventory	2,00,000	5,00,000
Bills Payable	3,00,000	2,40,000	Sundry Debtors	6,00,000	6,00,000
Bank Loan (Temporary)		1,00,000	Payments in Advance	40,000	—
			Cash at Bank	3,00,000	1,60,000
			Cash in hand	1,00,000	40,000
	8,00,000	9,40,000		12,40,000	13,00,000

Sales : 1995 Rs. 70,00,000
1996 Rs. 60,00,000 *(Panjabi Uni., B. Com.)*

Solution :

For the study of liquidity position, the following ratios are calculated :

(i) $$\text{Current Ratio} = \frac{\text{Current Assets}}{\text{Current Liabilities}}$$

$$1995 = \frac{12,40,000}{8,00,000} = 1.55:1$$

$$1996 = \frac{13,00,000}{9,40,000} = 1.38:1$$

(ii) $$\text{Quick Ratio} = \frac{\text{Quick Assets}}{\text{Quick Liabilities}}$$

$$1995 = \frac{10,40,000}{8,00,000} = 1.30:1$$

$$1996 = \frac{8,00,000}{9,40,000} = 0.85:1$$

(iii) $$\text{Average Age of Debtors} = \frac{\text{Sundry Debtors}}{\text{Sales}} \times 365$$

$$1995 = \frac{6,00,000}{70,00,000} \times 365$$

$$= 31.3 \text{ days}$$

$$1996 = \frac{6,00,000}{60,00,000} \times 365 = 36.5 \text{ days}$$

Note : 365 days are taken in a year.

Comments on the Liquidity Position of the Company

(1) The current ratio of the company is unsatisfactory in both the years and it has still deteriorated in 1996 as compared to 1995. As a standard norm, this ratio should be 2 : 1 but in this case this ratio is less than the standard in both the years. There are only 1.55 current assets as compared to 1 current liability and it goes down to 1.38 in the following year. The cover of current assets to meet current liabilities is not satisfactory.

(2) As compared to current ratio, quick ratio is better. In 1995 quick ratio is 1.30 : 1 which is more than the standard ratio of 1 : 1. This ratio has decreased to .85 : 1 in 1996 which shows that the availability of quick assets to pay current liabilities has gone down. The liquidity position is marginally satisfactory.

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(3) The collection period from debtors has increased from 31.3 days to 36.5 days which is a bad thing. The company's debt collection machinery has slowed down.

(4) Inventory has increased by $2\frac{1}{2}$ times in 1996 as compared to 1995. This shows that company has not been able to sell the goods in the market. Stock-piling shows that company's goods are not in more demand. The liquidity of the company has been adversely affected by the increase of inventory.

(5) The over-all liquidity position of the company is unsatisfactory.

Problem 2.4. Calculate :

(a) Current Assets
(b) Liquid Assets
(c) Inventory
Current Ratio = 2.6 : 1
Liquid Ratio ; 1.5 : 1
Currents Liabilities = Rs. 40,000

Solution :

$$\text{Current Ratio} = \frac{\text{Current Assets}}{\text{Current Liabilities}}$$

$$2.6 = \frac{\text{Current Assets}}{40,000}$$

(a) Current Assets = $40,000 \times 2.6$ = Rs. 1,04,000
(b) Liquid Assets = $40,000 \times 1.5$ = Rs. 60,000
(c) Inventory = Current Assets – Liquid Assets
= Rs. 1,04,000 – 60,000
= Rs. 44,000

Problem 2.5. From the following information, calculate :

(a) Current Assets
(b) Current Liabilities
(c) Inventory
Current Ratio = 2.8
Liquid Ratio = 1.5
Working Capital = Rs. 90,000

Solution :

Working Capital = Current Assets – Current Liabilities
Let Current Liabilities be x, so current assets will be $2.8x$

$$90,000 = 2.8x - x$$
$$90,000 = 1.8x$$
$$x = \frac{90,000}{1.8}$$
$$= \text{Rs. } 50,000$$

Since, current liabilities are represented by x, so current liabilities are Rs. 50,000.
and, Current Assets = Rs. $50,000 \times 2.8$ = Rs. 1,40,000
Liquid Assets = Rs. $50,000 \times 1.5$ = Rs. 75,000
Inventory = Current Assets – Liquid Assets
Inventory = Rs. 1,40,000 – 75,000 = Rs. 65,000

Problem 2.6. Calculate Current ratio, when inventory is Rs. 80,000 prepaid expenses are Rs. 20,000, quick ratio is 2.5 to 1 and current liabilities are Rs. 50,000.

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Solution :

$$\text{Quick Ratio} = \frac{\text{Quick (Liquid) Assets}}{\text{Current Liabilities}}$$

$$2.5 = \frac{\text{Liquid Assets}}{50,000}$$

Liquid Assets = Rs. 50,000 × 2.5 = Rs. 1,25,000

Current Assets = Liquid Assets + Inventory + Prepaid Expenses
= Rs. 1,25,000 + 80,000 + 2,000
= Rs. 2,07,000

$$\text{Current Ratio} = \frac{\text{Current Assets}}{\text{Current Liabilities}}$$

$$= \frac{2,07,000}{50,000} = 4.14$$

Problem 2.7. Current liability of a company is Rs. 30,000. If current ratio is 3 : 1 and quick ratio is 1 : 1, calculate the value of stock in trade.

Solution :

$$\text{Current Ratio} = \frac{\text{Current Assets}}{\text{Current Liabilities}}$$

$$3 = \frac{\text{Current Assets}}{30,000}$$

$\therefore$ Current Assets = Rs. 30,000 × 3 = Rs. 90,000

$$\text{Quick Ratio} = \frac{\text{Liquid Assets}}{\text{Current Liabilities}}$$

$$1 = \frac{\text{Liquid Assets}}{30,000}$$

$\therefore$ Liquid Assets = Rs. 30,000
Current Assets – Liquid Assets = Stock in trade
(As there are no prepaid expenses)
Or, Rs. 90,000 – 30,000 = Stock in trade
or, Stock in trade = Rs. 60,000.

Problem 2.8. Given :

Current Ratio	2.5
Liquidity Ratio	1.5
Working Capital	Rs. 60,000

Calculate :

(a) Current Liabilities
(b) Current Assets
(c) Liquid Assets
(d) Stock

Solution :

Current Assets – Current Liabilities = Working Capital
Let Current liabilities be x, so current assets will be 2.5 x.

$2.5x - x$ = Rs. 60,000
$1.5x$ = Rs. 60,000
x = Rs. 40,000

(a) Since current liabilities are represented by x, so Current liabilities are = Rs. 40,000
(b) Current Assets = 2.5 × 40,000 = Rs. 1,00,000

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$$(c)\ \text{Liquid Ratio} = \frac{\text{Liquid Assets}}{\text{Current Liabilities}}$$

$$1.5 = \frac{\text{Liquid Assets}}{40{,}000}$$

Or, Liquid Assets = Rs. 40,000 × 1.5 = Rs. 60,000

(d) Stock = Current Assets – Liquid Assets
= Rs. 1,00,000 – 60,000
= Rs. 40,000.

Problem 2.9. Rama & Co. supplies you the following information regarding the year ending Dc. 31, 1994.

Cash sales Rs. 80,000 credit sales Rs. 2,00,000, returns inward Rs. 10,000, opening stock Rs. 25,000, closing stock Rs. 30,000, gross profit ratio is 25%. Find out Inventory turnover.

Solution :

$$\text{Inventory Turnover} = \frac{\text{Cost of goods sold}}{\text{Average Inventory at cost}}$$

Net sales = 80,000 + 2,00,000 – 10,000 = Rs. 2,70,000

Cost of goods Sold = Sales– Gross Profit
= 2,70,000 – (25% of 2,70,000)
= 2,70,000 – 67,500
= Rs. 2,02,500

$$\text{Average Inventory} = \frac{25{,}000 + 30{,}000}{2}$$

= Rs. 27,500

$$\text{Inventory Turnover} = \frac{\text{Rs. } 2{,}02{,}500}{\text{Rs. } 27{,}500} = 7.36 \text{ times}$$

Problem 2.10 *(a)* Current ratio is 2.6 : 1 and current liabilities are Rs. 40,000. Find out current assets.

(b) Find out current liabilities and inventory when current assets are Rs. 50,000, current ratio is 3 : 1.5 and quick ratio is 1.5 : 1.0.

(c) Current assets are Rs. 1,20,000 ; current liabilities are Rs. 80,000 ; and value of inventory is Rs. 40,000, find out :

(i) Current ratio

(ii) Quick ratio.

Solution :

$$(a)\ \text{Current ratio} = \frac{\text{Current Assets}}{\text{Current Liabilities}}$$

$$2.6 = \frac{\text{Current Assets}}{40{,}000}$$

Current assets = 2.6 × 40,000
= Rs. 1,04,000

(b) Current assets = Rs. 50,000

$$\text{Current ratio} = \frac{\text{Current Assets}}{\text{Current Liabilities}}$$

$$\frac{3}{1.5} = \frac{50{,}000}{\text{Current Liabilities}}$$

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$$\text{Current liabilitis} = \frac{50,000 \times 1.5}{3} = \text{Rs. } 25,000$$

Quick assets = 25,000 × 1.5 = Rs. 37,500

Inventory = Current assets – Quick assets

= 50,000 – 37,500 = Rs. 12,500

(c) (i) Current ratio = Current assets : Current liabilities.

=1,20,000 : 80,000

= 1.5 : 1.

(ii) Quick ratio = Quick assets : Current liabilities

Quick assets = Current assets – Inventory

= 1,20,000 – 40,000

= Rs. 80,000

Quick ratio = 80,000 : 80,000

= 1.1

Problem 2.11. The current ratio of a company is 2 : 1. Which of the following suggestions would improve the ratio, which would reduce it and which would not change it.

(a) To pay a current liability.

(b) To sell a motor car for cash at a slight loss.

(c) To borrow money for a short time on an interest bearing promissory note.

(c) To purchase stock for cash.

(e) To give an interest bearing promissory note to a creditor to whom money was to be paid. *(Punjabi Uni ; B. Com.)*

Solution :

The current ratio will be affected under various situations as follows :

(a) The payment of current liability will improve the current ratio. The payment of current liability will reduce both current liabilities and current assets. When same amount will be reduced from both current liabilities and current assets, the current ratio will be more than 2 : 1.

(b) The sale of a Motor Car will improve the current ratio. Motor Car is a fixed asset and its sale will increase cash and ultimately current assets. At the same time there is no corresponding increase in current liabilities so current ratio will be more than 2. It does not matter even if the motor car is sold at a slight loss.

(c) It will reduce the current ratio. The increase in current assets and current liabilities by the same amount will reduce the current ratio.

(d) It will not affect current ratio. The purchase of stock will involve the payment of cash. The total amount of current assets will remain the same.

(e) The transaction will not affect the current ratio. Giving of a promissory note to a creditor will not change current liabilities, though the composition of current liabilities will change.

Problem 2.12. Describe the effect of each of the transactions listed below on indicated ratios. Will the ratio increase, decrease, remain unchanged ?

	Transactions	*Ratio*
(a)	Payment of accounts payable.	Quick ratio of 0.6 to 1.
(b)	Bad debts written off against an adequate balance in the reserve account.	Average age of account receivable of 60 days.
(c)	Declaration of dividend on perference shares.	Equity Ratio of 0.6.
(d)	Conversion of long-term loans into ordinary shares.	Return on total long-term capital.

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(e) Change from FIFO to LIFO during period of rising prices. — Inventory Turnover

Solution :

Effect of various transactions on the ratios will be :

(a) **Decrease.** The payment of accounts payable will reduce the figure of current liabilities and quick assets will also decrease. The quick ratio will decrease in this case.

(b) **No Change.** Average age of accounts receivable of 60 days will not be affected by writing off bad debts against provision account. The provision for bad debts is not reduced from total debtors.

(c) **Reduce.** The issue of dividend on preferenc shares will reduce profit for equity shareholders.

(d) **No. Change.** Total long-term capital includes both equity and preference share capital and long-term loans. The conversion of long-term loans into ordinary shares will not affect the return on total long-term capital.

(e) **Increase.** The change of pricing materials from first in first out (FIFO) method to last in first out (LIFO) method during rising prices will reduce the value of stock. The stock purchased at present prics will be issued first and stock purchased at earlier prices will reduce the value of stock which will ultimately increase inventory turnover.

Problem 2.13. State whether the following transactions, increase or decrease or do not effect the working capital and give reasons ;

(a) A company issues Rs. 1,00,000 worth shars for cash.
(b) Redemption of Debentures worth Rs. 2,00,000.
(c) Amount received from debtors Rs. 50,000.
(d) Amount paid to creditors Rs. 20,000.
(e) Plant sold for Rs. 40,000.
(f) Raw material purchased worth Rs. 50,000 from X & Co. on credit basis.
(h) Purchased plant worth Rs. 1,00,000 by issing equal amount of Debentures of Rs. 500 each.
(i) Paid Rs. 20,000 towards the cost of issue of shares.
(j) Debentures worth Rs. 1,00,000 reduced by raising a long-term loan of equal amount from the U.T.I.

Solution :

(a) The effect of this transaction is that cash (current assets) will increase by Rs. 1,00,000 and current liabilities will remain the same. Hence, the working capital will increase by Rs. 1,00,000.

(b) Redemption of debentures will decrease cash or currnt assets while current liabilities will remain unchanged. Hence, the working capital will decrease by Rs. 2,00,000.

(c) The effect of amount received from sundry debtors Rs. 50,000 shall be that cash will increase and sundry debtors will decrease. However, both these items are current assets and hence working capital will not change.

(d) The effect of cash paid to creditors is that both current assets and current liabilities are reduced by the same amount and hence there will be no change in working capital.

(e) Plant sold for Rs. 40,000 will increase cash or current assets, while the current liabilities will remain unchanged. Hence, working capital will increase by Rs. 40,000.

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(f) Raw material purchased from X & Co. for Rs. 50,000 will have no effect on working capital as both current assets and current liabilities will increase by the same amount.

(g) The working capital will decrease when furniture is purchased on cash as current assets will decrease. In case furniture is purchased on credit, the current liabilities will increase and this too will decrease the working capital.

(h) When plant is purchased by issue of debentures, both current assets and current liabilities remain unchanged. Hence, there will be no change in working capital.

(i) The effect of this transaction is that cash or, current assets will decrease while current liabilities will remain the same. Hence, working capital will decrease by Rs. 20,000.

(j) When debentures are redeemed by raising a long-term loan of equal amount, the current assets and current liabilities remain unchanged and hence, there will be no change in working capital.

Problem 2.14. A trader purchases goods both on cash as well as on credit terms. The following particulars are obtained from the books.

	Rs.
Total Purchases	3,00,000
Cash Purchases	30,000
Purchases Returns	51,000
Creditors at the end	1,05,000
Bills Payable at the end	60,000
Reserve for discount on Creditors	8,000

Calculate Average Payment Period

Solution :

Average Payment Period

$$\text{Average Payment Period} = \frac{\text{Trade creditors (Creditors + Bills Payable)}}{\text{Average Daily Purchases}}$$

$$\text{Average Daily Purchases} = \frac{\text{Annual Credit Purchases}}{\text{No. of Working days in a year}}$$

$$\text{or, Average Payment Period} = \frac{\text{Trade creditors} \times \text{No. of Working days in a year}}{\text{Net Annual Credit Purchases}}$$

$$= \frac{1,05,000 + 60,000}{2,19,000} \times 365$$

$$= \frac{1,65,000}{2,19,000} \times 365 = 275 \text{ days}$$

Note : 365 days in a year are taken

Problem 2.15. A company sells goods on cash as well as on credit. The following particulars are extracted from th ir books of accounts :

	Rs.
Gross Total Sales	4,00,000
Cash Sales	80,000
Sales Returns	28,000
Debtors at the end	36,000
Bills Receivable at the end	8,000

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Provision for doubtful debts	3,000
Total creditors at the end	25,000

Calculate Average Collection Period.

Solution :

Average Collection Period

$$\text{Average Collection Period} = \frac{\text{Trade Debtors (Debtors + Bills Receivables)}}{\text{Sales per day}}$$

$$\text{Sales per day} = \frac{\text{Net Sales}}{\text{No. of Working days}}$$

$$\text{or, Average Collection Period} = \frac{\text{Trade Debtors} \times \text{No. of Working days}}{\text{Net Sales}}$$

$$= \frac{(36,000 + 8,000) \times 365}{(4,00,000 - 80,000 - 28,000)} \times 365$$

$$= \frac{44,000}{2,92,000} \times 365$$

$$= 55 \text{ days}$$

Note : 365 days are taken in a year.

Problem 2.16. Find out :

(i) Net Purchases

(ii) Creditors Turnover Ratio.

Gross profit on sales is 20% and value of gross profit is Rs. 60,000. Stock turnover ratio is 6 times and opening stock is Rs. 8,000 less than the closing stock. Opening sundry crditors Rs. 40,000 and closing sundry creditors are Rs. 50,000.

Solution :

Gross Profit = Rs. 60,000

Rate of G. P. on Sales = 20%

$$\therefore \text{ Sales} = \text{Rs. } 60,000 \times \frac{100}{20} = \text{Rs. } 3,00,000$$

Cost of Goods sold = Sales – Gross Profit

= Rs. 3,00,000 – 60,000

= Rs. 2,40,000

(i) Purchases (Net) = Cost of Goods Sold + Closing Stock – Opening Stock

= 2,40,000 + 8,000 = Rs. 2,48,000

$$\textit{(ii)}\ \text{Creditors Turnover Ratio} = \frac{\text{Average Net Purchases}}{\text{Average Trade Creditors}}$$

$$= \frac{2,48,000}{\left(\frac{40,000 + 50,000}{2}\right)}$$

$$= \frac{2,48,000}{45,000}$$

$$= 5.51 \text{ times.}$$

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Problem 2.17 Pearl Ltd. gives you the following Balance Sheet for the year ending December 31, 1995.

BALANCE SHEET

Liabilties	*Rs.*	*Assets*	*Rs.*
Equity Capital		Goodwill	50,000
20,000 shars of Rs. 10 each	2,00,000	Plant & Machinery	2,50,000
Preference Capital 50,000 shares of		Furniture & Fittings	70,000
Rs. 20 each	1,00,000	Trade Investments	1,50,000
Reserve Fund	50,000	Cash	20,000
Dividend Equalisation Fund	60,000	Sundry Debtors	1,25,000
Profit and Loss A/c	40,000	Bills Receivables	65,000
5% Debentures	1,50,000	Advance Tax	20,000
7% Mortgage Loan	70,000		
Sundry Creditors	50,000		
Bank Overdraft	30,000		
	7,50,000		7,50,000

Calculate the following ratios :

(a) Debt - Equity Ratio.

(b) Funded Debt to Total Capitalisation.

(c) Proprietory Ratio

(d) Solvency Ratio

(e) Fixed Assets to Net-Worth Ratio.

(f) Current Assets to Proprietors' Funds Ratio.

Solution :

(a) $\text{Debt-Equity Ratio} = \dfrac{\text{Outsiders' Funds}}{\text{Shaholders' Funds}}$

Outsiders' Funds = Rs. 1,50,000 + Rs. 70,000 + Rs. 50,000 + Rs. 30,000
= Rs. 3,00,000

Shareholders' Funds = Rs. 2,00,000 + Rs. 1,00,000 + Rs. 50,000 + Rs. 60,000 + Rs. 40,000 = Rs. 4,50,000

$$\text{Debt-Equity Ratio} = \frac{\text{Rs. 3,00,000}}{\text{Rs. 4,50,000}} = 0.67$$

(b) $\text{Funded Debt to Total Capitalisation} = \dfrac{\text{Funded Debt}}{\text{Total Capitalisation}}$

Funded Debt = Rs. 1,50,000 + Rs. 70,000 = Rs. 2,20,000

Total Capitalisation = Rs. 2,00,000 + Rs. 1,00,000 + Rs. 50,000 + Rs. 60,000 + Rs. 40,000 + Rs. 1,50,000 + Rs. 70,000 = Rs. 6,70,000

$$\text{Funded Debt to Total Capitalisation} = \frac{\text{Rs. 2,20,000}}{\text{Rs. 6,70,000}} = 0.33$$

(c) $\text{Proprietory Ratio} = \dfrac{\text{Shareholders Funds}}{\text{Total Assets}}$

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$$= \frac{\text{Rs. } 4,50,000}{\text{Rs. } 7,50,000} = 0.6$$

(d) Solvency Ratio $= \dfrac{\text{Total Liabilities to Outsiders}}{\text{Total Assets}}$

$$= \frac{\text{Rs. } 3,00,000}{\text{Rs. } 7,50,000} = 0.4$$

Alternatively, Solvency Ratio = 1.0 – Proprietory Ratio = 1.0 – 0.6 = 0.4

(e) Fixed Assets to Net Worth Ratio $= \dfrac{\text{Fixed Assets}}{\text{Net Worth}}$

Net worth is quivalent to shareholders funds.

Fixed Assets = Rs. 50,000 + Rs. 2,50,000 + Rs. 70,000 = Rs. 3,70,000

Fixed Assets to Net Worth Ratio $= \dfrac{\text{Rs. } 3,70,000}{\text{Rs. } 4,50,000} = 0.82$

Proprietors' funds are equivalent to shareholders funds

Current Assets = Rs. 20,000 + Rs. 1,25,000 + Rs. 65,000 + Rs. 20,000
= Rs. 2,30,000

Current Assets to Proprietory Funds Ratio $= \dfrac{\text{Rs. } 2,30,000}{\text{Rs. } 4,50,000} = 0.51$

Note : Trade investments have not been included in fixed asset because these amounts are invested in outside securities.

Problem 2.18. The financial statements of a company for the past two years are summarised below :

		1995	*1996*
		Rs.	*Rs.*
Assets :			
	Cash	—	1,600
	Trade Debtors	55,000	40,000
	Stock-in-trade	55,000	45,000
	Fixed Assets (Net)	1,37,000	1,45,400
		2,47,000	2,32,000
		Rs.	*Rs.*
Liabilities :			
	Trade Creditors	32,000	25,000
	Provision for taxation	11,000	9,000
	Bank Overdraft	12,000	—
	Paid-up Capital	1,50,000	1,50,000
	General Reserve	30,000	35,000
	P/L Appropriation A/c.	12,000	13,000
		2,47,000	2,32,000

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	Rs.	*Rs.*	*Rs.*	*Rs.*
Sales		4,00,000		3,75,000
Less Cost of goods sold	2,45,000		2,25,000	
Other Expenses	1,30,000		1,32,000	
		3,75,000		3,57,000
Net Profit		25,000		18,000

Opening Stock on 1st Janaury 1995 was Rs. 60,000
Calculate the follwing ratios for two years :

(1) *Current Ratio*
(2) *Liquidity Ratio*
(3) Stock Turnover Ratio
(4) *Debtors Turnover Ratio*
(5) *Average Collection Period*
(6) *Return on proprietor's funds.*

Solution :

(1) *Current Ratio*

Current Ratio = Current Assets : Current Liabilities

1995 = 1,10,000 : 55,000 (Bank overdraft is treated current liability)

2 : 1

1996 = 86,600 : 34,000

= 2.547 : 1

(2) Liquidity Ratio :

Liquidity Ratio = Liquid Assets : Current Liabilities

1995 = 55,000 : 55,000

= 1 : 1

1996 = 41,600 : 34,000

= 1.22 : 1

(3) Stock Turnover Ratio :

$$\text{Stock Turnover Ratio} = \frac{\text{Cost of goods sold}}{\text{Average Inventory at Cost}}$$

$$1995 = \frac{2,45,000}{\frac{55,000 + 60,000}{2}}$$

$$= \frac{2,45,000}{57,500} = 4.26$$

$$1996 = \frac{2,25,000}{\frac{(55,000 + 45,000)}{2}} = 4.5$$

(4) *Debteros Turnover Ratio*

$$\text{Debtors Turnover Ratio} = \frac{\text{Sales}}{\text{Average Debtors}}$$

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$$1995 = \frac{4,00,000}{55,000} = 7.27$$

$$1966 = \frac{3,75,000}{50,000} \left(\frac{55,000 + 45,000}{2} \right) = 7.50$$

(5) *Average Collection Period*

$$\text{Average Collection Period} = \frac{\text{Debtors}}{\text{Sales}} \times \text{No. of Working days in a Year}$$

$$1995 = \frac{55,000}{4,00,000} \times 360 = 49.5 \text{ or } 50 \text{ days}$$

$$1996 = \frac{\frac{55,000 + 45,000}{2}}{37,500} \times 360$$

= 45.6 or 46 days (360 days are taken in a year)

(6) *Return on proprietor's funds*

$$\text{Return on proprietor's funds} = \frac{\text{Net Profit before Dividend}}{\text{Proprietor's funds}} \times 100$$

$$1995 = \frac{25,000}{1,92,000} \times 100 = 13.02\%$$

$$1996 = \frac{18,000}{1,98,000} \times 100 = 9.09\%$$

Problem 2.19. From the data given below compute :

(a) Working Capital, (b) Net Capital Employed, (c) Current Ratio, (d) Acid Test Ratio, (e) Debt-Equity Ratio, (f) Fixed Assets Ratio.

Also comment on the financial health of the company.

QUEST ELECTRO LIMITED BALANCE SHEET

fas at 31-12-1994

Liabilities		*Rs.*	*Assets*	*Rs.*
Equity Share Capital		25,000	Fixed Assets	30,000
Preference Share Capital		5,000	Current Assets :	
Reserves & Surplus		4,000	Stores	2,000
Debentures		8,000	Sundry Debtors	1,000
Bank Loan		4,000	Cash in hand	500
Sundry Creditors		1,000	Balance at Bank	2,500
Proposed Dividends		1,000	Preliminary Expenses	8,000
Provision for taxation		2,000	Brokerage on shares	2,000
Contigent liabilities	2,000		Stock-in-trade	4,000
		50,000		50,000

Solution :

(a) Working Capital

Working Capital = Current Assets – Current Liabilities

(2,000 + 1,000 + 500 + 2,500 + 4,000)

– (1,000 + 1,000 + 2,000)

= 10,000 – 4,000

= Rs. 6,000

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(b)Net Capital Employed

Net Capital Employed = All Assets (except fictitious assets) – Current liabilities
= 40,000 – 4,000
= Rs. 36,000

(c) Current Ratio

Current Ratio = Current Assets : Current Liabilities
= 10,000 : 4,000
= 2.5 : 1

(d) Acid Test Ratio

Acid Test Ratio = Liquid Assets : Liquid Liabilities
= 4,000 : 4,000
= 1 : 1

(e) Debt-Equity Ratio

Debt-Equity Ratio = Outsiders' Funds : Shareholders' funds
= (8,000 + 4,000 + 1,000 + 1,000 + 2,000) : (25,000 + 5,000 + 4,000)
= 16,000 : 34,000 = .47 : 1

(f) Fixed Assets Ratio

Fixed Assets Ratio = Fixed Assets : Long Term Funds
= 30,000 : (25,000 + 5,000 + 4,000 + 8,000 + 4,000)
= 30,000 : 46,000 = 0.65 : 1

Problem 2.20. The following is the Trading and Profit and Loss Account of a concern for the year ending Dec. 31, 1995 :

	Rs.		*Rs.*
To Opening Stock	76,250	By Sales	5,00,000
To Purchases	3,15,250	By Closing Stock	98,500
To Factory Expenses	7,000		
To Gross Profit c/d	2,00,000		
	5,98,500		5,98,500
To Administrative Expenses	1,01,000	By Gross Profit b/d	2,00,000
To Selling and Distribution Expenses	12,000	By Non-operating income	6,000
To Non-operating Expenses	9,000		
To Net Profit	84,000		
	2,06,000		2,06,000

You are required to calculate : –

(a) Expenses ratio *(b)* Gross profit ratio
(c) Operating ratio *(d)* Operating profit ratio
(e) Net profit ratio.

Solution :

(a) **Expenses Ratios :** A number of Expenses ratios can be calculated relating to various expenses.

(i) Factory Expenses Ratio $= \frac{\text{Factory Expenses}}{\text{Sales}} \times 100$

$= \frac{7,000}{5,00,000} \times 100 = 1.4\%$

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(ii) Administration Expenses Ratio

$$= \frac{\text{Administrative Expenses}}{\text{Sales}} \times 100$$

$$= \frac{1,01,000}{5,00,000} \times 100 = 20.2\%$$

(iii) Selling and Distribution Expenses Ratio

$$= \frac{\text{Selling \& Distribution Expenses}}{\text{Sales}} \times 100$$

$$= \frac{12,000}{5,00,000} \times 100 = 2.4\%$$

(iv) Non-operating Expenses Ratio

$$= \frac{\text{Non-operating Expenses}}{\text{Sales}} \times 100$$

$$= \frac{9,000}{5,00,000} \times 100 = 1.8\%$$

(b) Gross Profit Ratio $= \frac{\text{Gross Profit}}{\text{Sales}} \times 100$

$$= \frac{2,00,000}{5,00,000} \times 100 = 40\%$$

(c) Operating Ratio $= \frac{\text{Operting Expenses}}{\text{Sales}} \times 100$

Operating Expenses = Cost of Goods Sold + Administrative Expenses + Selling and Distribution Expenes

$= 3,00,000 + 1,01,000 + 12,000 = 4,13,000$

$$= \frac{4,13,000}{5,00,000} \times 100 = 82.6\%$$

(d) Operating Profit Ratio

$$= \frac{\text{Operating Profit}}{\text{Sales}} \times 100$$

$$= \frac{87,000}{5,00,000} \times 100 = 17.4\%$$

(e) Net Profit Ratio $= \frac{\text{Net Profit}}{\text{Sales}} \times 100$

$$= \frac{84,000}{5,00,000} \times 100 = 16.8\%$$

Problem 2.21. The following are the Summarised profit and loss account and balance sheet of SN. Ltd. for the year ending March 31, 1995.

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PROFIT AND LOSS ACCOUNT

	Rs.		Rs.
To opening stock	99,500	By sales	9,50,000
To Purchases	5,45,250	By Closing Stock	1,49,000
To Wages	14,250		
To Gross Profit	3,40,000		
	9,99,000		9,99,000
To Administrative expenses	1,50,000	By Gross profit b/d	3,40,000
To Selling expenses	30,000	By Interest	3,000
To Finance charges	15,000	By profit on sale of investments	6,000
To Loss on sale of assts	4,000		
To New Profit	1,50,000		
	3,49,000		3,49,000

BALANCE SHEET

Liabilities	Rs.	*Assets*	Rs.
Share capital	2,00,000	Buildings	1,50,000
Reserves	90,000	Machinery	80,000
Profit & Loss A/c.	60,000	Stock	1,49,900
Current Liabilities	1,30,000	Debtors	71,000
		Cash	30,000
	4,80,000		4,80,000

You are required to calculate the following ratios and state the purpose they serve :

(*a*) Current ratio (*d*) Stock turnover ratio
(*b*) Liquid ratio (*e*) Return on net capital employed
(*c*) Operating ratio

Solution :

(*a*) $$\text{Current Ratio} = \frac{\text{Current Assets}}{\text{Current Liabilities}}$$

Current Assets = Rs. 1,49,000 + 71,000 + 30,000 = Rs. 2,50,000

Current Liabilities = Rs. 1,30,000

$$\therefore \text{Current Ratio} = \frac{2,50,000}{1,30,000} = 1.923$$

(*b*) $$\text{Liquid Ratio} = \frac{\text{Liquid Assets}}{\text{Liquid (current) Liabilities}}$$

$$= \frac{71,000 + 30,000}{1,30,000}$$

$$= 0.776$$

(*c*) $$\text{Operating Ratio} = \frac{\text{Cost of goods sold + Operating expenses}}{\text{Net Sales}} \times 100$$

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Cost of goods sold = Opening Stock + Purchases + Wages – Closing Stock
= 99,500 + 5,45,250 + 14,250 – 1,49,000
= Rs. 5,10,000

Operating Expenses = Administrative + Selling Expenses
= Rs. 1,50,000 + 30,000 = Rs. 1,80,000

$$\therefore \text{ Operating Ratio} = \frac{5,10,000 + 1,80,000}{8,50,000} \times 100$$
$$= 81.176\%$$

(d) $$\text{Stock Turnover Ratio} = \frac{\text{Cost of Goods Sold}}{\text{Average Stock}}$$

$$= \frac{5,10,000}{\frac{99,500 + 1,49,000}{2}}$$

$$= \frac{5,10,000}{1,24,250}$$
$$= 4.1 \text{ times}$$

(e) Return on Net capital Employed

$$= \frac{\text{Adjusted Net Profit}}{\text{Net Capital Employed}} \times 100$$

Adjusted Net Profit = Rs.1,50,000 + 4,000 + 15,000 – 3,000 – 6,000
= Rs. 1,60,000

Net Capital Employed = Rs. 4,80,000 – 1,30,000 = Rs. 3,50,000

$$\therefore \text{ Return on Net Capital Employed} = \frac{1,60,000}{3,50,000} \times 100$$
$$= 45.71\%$$

Problem 2.22. Following are the Trading Account, Profit and Loss Account and Balance Sheet of Mercury Private Limited

TRADING AND PROFIT AND LOSS ACCOUNT

for the year ended 31st March, 1996

	Rs.		*Rs.*
To Opening Stock	5,80,000	By Sales	30,00,000
To Purchases	24,40,000	By Closing Stock	6,20,000
To Gross Profit	6,00,000		
	36,20,000		36,20,000
To Sudry expenses	3,20,000	By Gross Profit	6,00,000
To Net Profit	2,80,000		
	6,00,000		6,00,000

BALANCE SHEET

as on 31st March, 1996

Liabilities	*Rs.*	*Assets*	*Rs.*
Share Capital	28,00,000	Net Block	22,00,000
Reserves & Surplus		*Current Assets*	
Balance 2,00,000		Stock	6,20,000

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Profit for the year	2,80,000	4,80,000	Debtors	3,20,000
Bank Overdraft		1,40,000	Cash	8,80,000
Creditors		6,00,000		
		40,20,000		40,20,000

You are required to calculate :

(i) Current Ratio *(ii)* Quick Ratio

(iii) Gross Profit to Sales *(iv)* Stock Turnover

(v) Debtors turnover *(vi)* Net Profit to Paid-up Capital.

Solution :

(i) Current Ratio = Current Assets : Current Liabilities

= 18,20,000 : 7,40,000

= 2.45 : 1.

(ii) Quick Ratio = Quick Assets : Current Liabilities

= 12,00,000 : 7,40,000

= 1.6 : 1.

(iii) Gross Profit to Sales

$$= \frac{\text{Gross Profit}}{\text{sales}} \times 100$$

$$= \frac{6,00,000}{30,00,000} \times 100$$

= 20%.

(iv) $$\text{Stock Turnover} = \frac{\text{Cost of Sales}}{\text{Average Stock}}$$

$$\text{Average Stock} = \frac{\text{Opening Stock + Closing Stock}}{2}$$

$$= \frac{5,80,000 + 6,20,000}{2}$$

= 6,00,000

$$\text{So, Stock Turnover} = \frac{24,00,000}{6,00,000}$$

= 4 times

(v) Debtors Turnover Ratio

$$= \frac{\text{Sales}}{\text{Average Debtors}}$$

$$= \frac{30,00,000}{3,20,000}$$

= 9.37 times.

(vi) Net Profit to Paid-up Capital

$$= \frac{\text{Net Profit}}{\text{Paid-up Capital}}$$

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$$= \frac{2,80,000}{28,00,000} \times 100$$

$$= 10\%.$$

Problem 2.23. From the data, calculate *(a)* gross profit ratio, *(b)* net profit ratio, *(c)* return on total assets, *(d)* inventory turnover, *(e)* working capital turnover, and *(f)* net worth to debt.

	Rs.		*Rs.*
Sales	25,20,000	Fixed Assets	14,40,000
Cost of sales	19,20,000	Net worth	15,00,000
Net Profit	3,60,000	Debt	9,00,000
Inventory	8,00,000	Current Liabilities	6,00,000
Other current assets	7,60,000		

[(Company Secretaries Final (New)]

Solution :

(a) Gross Profit ratio :

Gross Profit = Sales – Cost of sales

= Rs. 25,20,000 – Rs. 19,20,000

= Rs. 6,00,000

$$\text{Gross Profit Ratio} = \frac{\text{Rs. } 6,00,000}{\text{Rs. } 25,20,000} \times 100 = 23.81\%$$

(b) Net Profit Ratio :

$$= \frac{\text{Net Profit}}{\text{Sales}} \times 100$$

$$= \frac{\text{Rs. } 3,60,000}{\text{Rs. } 25,20,000} \times 100 = 14.29\%$$

(c) Return on Total Assets :

$$= \frac{\text{Net Profit}}{\text{Total Assets}} \times 100$$

Total Assets = Inventories + Other current Assets + Fixed assets.

= Rs. 8,00,000 + 7,60,000 + 14,40,000

= Rs. 30,00,000

Return on Total Assets

$$= \frac{\text{Rs. } 3,60,000}{\text{Rs. } 30,00,000} \times 100 = 12\%$$

(d) Inventory Turnover :

$$= \frac{\text{Cost of Sales}}{\text{Inventory}}$$

$$= \frac{\text{Rs. } 19,20,000}{\text{Rs. } 8,00,000} = 2.4 \text{ times.}$$

(e) Working Capital Turnover :

$$= \frac{\text{Cost of Sales}}{\text{Working Capital}}$$

Working Capital = Current Assets (including inventory) – Current Liabilities

= Rs. 8,00,000 + 7,60,000 – 6,00,000

= Rs. 9,60,000

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Working Capital Turnover

$$= \frac{\text{Rs. } 19,20,000}{\text{Rs. } 9,60,000} = 2 \text{ times}$$

(f) Net Worth to Debt Ratio

$$= \frac{\text{Net Worth}}{\text{Debt}}$$

$$= \frac{\text{Rs. } 15,00,000}{\text{Rs. } 9,00,000} = 1.6 \text{ times.}$$

Problem 2.24. The following are the figures extracted from the books of XYZ Limited as at 30-6-1996 :

Particulars	*Amount*
Net Sales	24,00,000
Less Operating expenses	18,00,000
Gross Profit	6,00,000
Less Operating expenses	2,40,000
Net Profit	3,60,000
Current Asset	7,60,000
Inventories	8,00,000
Fixed Assets	14,40,000
Total Assets	30,00,000
Net worth	15,00,000
Debt	9,00,000
Current Liabilities	6,00,000
Total Liabilities	30,00,000
Working Capital	9,60,000

Calculate : *(i)* Gross Profit Ratio, *(ii)* Net Profit Ratio, *(iii)* Return on Assets, *(iv)* Inventory Turnover, *(v)* Working Capital Turnover *(vi)* Net Worth to Debt.

Solution :

(i) Gross Profit Ratio $= \frac{\text{Gross Profit}}{\text{Net Sales}} \times 100$

$= \frac{6,00,000}{24,00,000} \times 100$

$= 25\%$

(ii) Net Profit Ratio $= \frac{\text{Net Profit}}{\text{Net Sales}} \times 100$

$= \frac{3,60,000}{24,00,000} \times 100$

$= 15\%$

(iii) Return on Assets $= \frac{\text{Net Profit}}{\text{Total Assets}} \times 100$

$= \frac{3,60,000}{30,00,000} \times 100$

$= 12\%$

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(iv) $\text{Inventory Turnover} = \dfrac{\text{Cost of goods sold}}{\text{Inventories}}$

Cost of Goods Sold = Sales – Gross Profit
= 24,00,000 – 6,00,000
= Rs. 18,00,000

$\text{Inventory Turnover} = \dfrac{18,00,000}{8,00,000}$
= 2.25 times

(v) Working Capital Turnover

$$= \frac{\text{Net Sales}}{\text{Working Capital}}$$

$$= \frac{\text{Net Sales}}{\text{Current Assets} - \text{Current Liabilities}}$$

$$= \frac{24,00,000}{(7,60,000 + 8,00,000) - 6,00,000}$$

$$= \frac{24,00,000}{9,60,000}$$

= 2.5 times.

(vi) Net Worth to Debt = Net Worth : Debt
= Rs. 15,00,000 : 9,00,000
= 5 : 3. or 1.67 times

Problem 2.25. From the following information, make out a statement of proprietors' funds with as many details as possible :

(i)	Crrent Ratio	2
(ii)	Liquid Ratio	1.25
(iii)	Proprietory Ratio (Fixed Assets/Proprietors' funds)	0.60
(iv)	Working Capital	Rs. 50,000
(v)	Reserves & Surplus	Rs. 25,000
(vi)	Bank overdraft (Liquid Liability)	10,000
(vii)	There is no Long-term loan or fictitious asset.	

Solution :

Working Capital = Current Assets – Current Liabilities
50,000 = 2.0 – 1.0
50,000 = 1.0

$\text{Current Liabilities} = \dfrac{50,000}{1} = \text{Rs. } 50,000$

Current Assets = 50,000 × 2 = Rs. 1,00,000
Quick Assets = 50,000 × 1.25 = Rs. 62,500
Stock = Current Assets – Quick Assets
Stock = 1,00,000 – 62,500 = Rs. 37,500

Let Proprietors' Funds be x.
So, Fixed Assets = 0.6 x.
Proprietors' Fund + Long-term liabilities + Current liabilities
= Fixed Assets + Current Assets + Fictitious Assets

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$$x + 0 + 50,000 = 0.6x + 1,00,000 + 0$$
$$x + 50,000 = 0.6 + 1,00,000$$
$$x - 0.6x = 1,00,000 - 50,000$$
$$0.4x = 50,000$$
$$x = \frac{50,000 \times 10}{4} = \text{Rs. } 1,25,000$$

Proprietors' funds = Rs. 1,25,000

Fixed Assets = 125,000 × 0.6

= Rs. 75,000

STATMENT OF PROPRIETORS' FUNDS

Proprietors' funds :	*Rs.*		
Share Capital		1,00,000	
Reserves & Surplus		25,000	
			1,25,000
Investment of Funds :			
Fixed Assets		75,000	
Current Assets :			
Stock	37,500		
Others	62,500	1,00,000	
Less : Current Liabilities :			
Bank Overdraft	10,000	1,75,000	
Others	40,000	50,000	1,25,000

Problem 2.26. The following are the ratios relating to the activities of National Traders Limited :

Stock Velocity : 6 months
Creditors Velocity : 2 months
Debtors Velocity : 3 months
Gross Profit Ratio : 25%

Gross Profit for the year ended 31st Dec. 1995 amounts to Rs. 4,00,000. Closing stock of the year is Rs. 10,000 above the opening stock, Bills receivable amount to Rs. 25,000 and bills payable to Rs. 10,000.

Find out :

(i) Sales *(ii)* Purchases
(iii) Sundry Creditors *(iv)* Sundry Debtors
(v) Closing Stock.

Solution :

(i) **Sales :**

Rate of Gross Profit and amount of sales are given with the help of which sales can be calculated.

$$\text{Gross Profit Ratio} = \frac{\text{Gross Profit}}{\text{Sales}}$$
$$\frac{25}{100} = \frac{4,00,000}{\text{Sales}}$$
$$\text{Sales} = 4,00,000 \times \frac{100}{25} = \text{Rs. } 16,00,000$$

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(ii) **Purchases :**

Purchases = Cost of goods sold + Closing Stock – Opening Stock

As G./P ratio is 25% so cost of goods sold is 100 – 25 or 75%

$$\text{Cost of goods sold} = \frac{16,00,000 \times 75}{100} = \text{Rs. } 12,00,000$$

Purchases = 12,00,000 + 10,000 (Closing stock is more than opening stock by Rs. 10,000)

= 12,00,0000 + 10,000 = Rs. 12,10,000

(iii) **Creditors :**

$$\text{Creditors Velocity} = \frac{\text{Total Creditors}}{\text{Credit Purchases}} \times 12$$

$$2 = \frac{\text{Total Creditors}}{\text{Credit Purchases}} \times 12$$

$$2 \times \text{Credit Purchases} = \text{Total Creditors} \times 12$$

$$2 \times 12,10,000 = \text{Total Creditors} \times 12$$

$$\text{Total Creditors} = \frac{2 \times 12,10,000}{12} = \text{Rs. } 2,01,667$$

Sundry Crditors = Rs. 2,01,667 – Rs. 10,000 = Rs. 1,91,667

All purchses are presumed credit purchases and 12 months are used instead of 365 days because creditors velocity is given in months.

(iv) **Debtors :**

$$\text{Debtors Velocity} = \frac{\text{Total Debtors}}{\text{Credit Sales}} \times 12$$

$$3 = \frac{\text{Total Debtors}}{\text{Credit Sales}} \times 12$$

$$3 \times \text{Credit Sales} = \text{Total Debtors} \times 12$$

$$3 \times 16,00,000 = \text{Total Debtors} \times 12$$

$$\text{Total Debtors} = \frac{3 \times 16,00,000}{12} = \text{Rs. } 4,00,000$$

Total Debtors = Sundry Debtors + Bills Receivables

So, Debtors in this case will be :

Debtors = 4,00,000 – 25,000 = Rs. 3,75,000

(v) **Closing Stock**

$$\text{Stock Velocity} = \frac{\text{Average Stock}}{\text{Cost of goods sold}} \times 12$$

$$6 = \frac{\text{Average Stock}}{12,00,000} \times 12$$

$$12 \times \text{Average Stock} = 12,00,000 \times 6$$

$$\text{Average Stock} = \frac{12,00,000 \times 6}{12} = \text{Rs. } 6,00,000$$

$$\text{Average Stock} = \frac{\text{Opening stock} + \text{Closing stock}}{2}$$

$$\text{Average Stock} = \frac{\text{Opening stock} + (\text{Opening stock} + 10,000)}{2}$$

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$$2 \times 6,00,000 = 2 \text{ Opening stock} + 10,000$$
$$2 \text{ Opening Stock} = 12,00,000 - 10,000$$
$$\text{Opening Stock} = \frac{11,90,000}{2} = \text{Rs. } 5,95,000$$
$$\text{Closing Stock} = 5,95,000 + 10,000$$
$$= \text{Rs. } 6,05,000$$

Problem 2.27. Given :

Reveivables turnover	= 4	Capital turnover ratio	= 2 times
Payables turnover	= 6	Fixed assets turnover ratio	= 8 times
Invntory turnover	= 8	Gross profit ratio	= 25%

Gross profit during the year amounts to Rs. 80,000. There is no long-term loan or overdraft. Reserves and surplus amount to Rs. 28,000. Ending inventory of the year is Rs. 2,000 above the beginning inventory. Notes receivable amount to Rs. 5,000 and notes payable are Rs. 2,000.

Prepare a Balance Sheet on the basis of the information given above.

(M. Com. Delhi.)

Solution :

$$\text{Gross Profit Ratio} = \frac{\text{Gross Profit}}{\text{Sales}}$$
$$25\% = \frac{80,000}{\text{Sales}}$$
$$\text{Sales} = 80,000 \times \frac{100}{25} = \text{Rs. } 3,20,000$$
$$\text{Cost of Sales} = \text{Sales} - \text{G. P.}$$
$$= 3,20,000 - 80,000 = \text{Rs. } 2,40,000$$
$$\text{Inventory Turnover} = \frac{\text{Cost of goods sold}}{\text{Average inventory}}$$
$$8 = \frac{2,40,000}{\text{Average inventory}}$$
$$\text{Average inventory} = \frac{\text{Rs. } 2,40,000}{8} = \text{Rs. } 30,000$$
$$\text{Average inventory} = \frac{\text{Opening inventory} + (\text{Opening inventory} + 2,000)}{2}$$
$$30,000 = \frac{2 \text{ Opening inventory} + 2,000}{2}$$
$$\text{Opening inventory} = \frac{30,000 \times 2 - 2,000}{2} = \text{Rs. } 29,000$$
$$\text{Closing inventory} = \text{Rs. } 29,000 + 2,000 = \text{Rs. } 31,000$$
$$\text{Receivable Turnover} = \frac{\text{Sales}}{\text{Trade Debtors}}$$
$$4 = \frac{3,20,000}{\text{Trade Debtors}}$$
$$\text{Trade Debtors} = \frac{3,20,000}{4} = \text{Rs. } 80,000$$

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Accounts Receivables = Trade Debtors – Notes Receivables
= 80,000 – 5,000 = Rs. 75,000

Purchases = Cost of Sales + 2,000 (excess closing inventory)
= 2,40,000 + 2,000 = Rs. 2,42,000

$$\text{Payables Turnover} = \frac{\text{Purchases}}{\text{Trade Creditors}}$$

$$6 = \frac{2,42,000}{\text{Trade Creditors}}$$

$$\text{Trade Creditors} = \frac{2,42,000}{6} = \text{Rs. } 40,333$$

Accounts Payable (Creditors)
= Trade Creditors – Notes Payable
= 40,333 – 2,000 = Rs. 38,333

$$\text{Fixed Assets Turnover} = \frac{\text{Cost of Sales}}{\text{Fixed Assets}}$$

$$8 = \frac{2,40,000}{\text{Fixed Assets}}$$

$$\text{Fixed Assets} = \frac{2,40,000}{8} = \text{Rs. } 30,000$$

$$\text{Capital Turnover Ratio} = \frac{\text{Cost of Sales}}{\text{Capital}}$$

$$\text{Capital} = \frac{2,40,000}{2} = \text{Rs. } 1,20,000$$

Share Capital = Capital (employed) – Reserves & Surplus
= 1,20,000 – 28,000 = Rs. 92,000

BALANCE SHEET OF ..... LTD.

as on.....

		Rs.			*Rs.*
Shareholder's Fund			Fixed Assets		30,000
Share Capital	92,000		Current Assets :		
Reserves and Surplus	28,000		Inventory	31,000	
		1,20,000	Accounts Receivables	75,000	
Current Liabilities			Notes Receivables	5,000	
Accounts Payable	38,333		Cash/bank		
Notes Payable	2,000		(Balancing figure)	19,333	
		40,333			1,30,333
		1,60,333			1,60,333

Problem 2.28. From the following, You are required to calculate the amount of capital employed.

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BLANCE SHEET

as on 30th June, 1996

		Rs.		Rs.
Share capital		3,00,000	Goodwill	20,000
Reserves (including profit of current year, Rs. 40,000)		60,000	Land & Building	70,000
Workmen compensation Fund		85,000	Plant	1,20,000
			Current Assets	3,00,000
			Investments	90,000
			Investments for replacement of Plant	20,000
Depriciation Fund :			Preliminary expenses	5,000
Land & Building	20,000			
Plant	30,000	50,000		
Debentures		70,000		
Creditors		60,000		
		6,25,000		6,25,000

(CAIIB Part II, Punjabi Univ., B. Com.)

Solution :

Capital Employed

	Rs.	Rs.
Land and Building	70,000	
Less Depreciation	20,000	50,000
Plant	1,20,000	
Less Depreciation	30,000	90,000
Current Assets		3,00,000
Investments (for replacement of Plant)		20,000
Gross Capital Employed		4,60,000
Less Creditors		60,000
Net Capital Employed		4,00,000

Alternatively

Capital Employed :	Rs.	
Share capital	3,00,000	
Reserves & Surplus	60,000	
Workmen compensation Fund	85,000	
Debentures	70,000	5,15,000
Less ajustments for :		
Goodwill	20,000	
Investments	90,000	
Preliminary Expenses	5,000	1,15,000
Net Capital Employed		4,00,000
Add Creditors		60,000
Gross Capital Employed		4,60,000

Problem 2.29. The following information is given about a limited company :

Profit after tax at 60% Rs. 3,00,000

Market price of equity share Rs. 50

Depreciation Rs. 40,000

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Equity dividend paid at 20%, Equity Capital of Rs. 10 shares Rs. 4,00,000, 9% Preference Share Capital Rs. 2,00,000.

Calculate :

(a) Dividend yield on Equity Shares

(b) Cover for Preference and Equity dividend

(c) Earning per Share

(d) Price Earning Ratio.

Solution :

(a) Dividend yield on Equity Shares

Dividend per Equity share :

$$= \frac{20}{100} \times 10 = \text{Rs. } 2$$

$$\text{Dividend Yield} = \frac{\text{Dividend per Share}}{\text{Market Value of Share}} \times 100$$

$$= \frac{2}{50} \times 100 = 4\%$$

(b) Cover for preference dividend

$$= \frac{\text{Earning available for Preference Shares}}{\text{Preference Dividend}}$$

$$= \frac{\text{Rs. } 3,00,000}{\text{Rs. } 18,000 \left(\frac{9}{100} \times \text{Rs. } 2,00,000 \right)} = 16.67 \text{ times}$$

Cover for Equity Dividend

$$= \frac{\text{Earning avaliable for equity dividend}}{\text{Equity Dividend}}$$

$$= \frac{3,00,000 - \text{Rs. } 18,000}{\frac{20}{100} \times 4,00,000}$$

$$= \frac{\text{Rs. } 2,82,000}{80,000} = 3.5 \text{ times.}$$

(c) Earning per Share

$$= \frac{\text{Profit after tax and preference dividend}}{\text{No. of Equity Shares}}$$

$$= \frac{2,82,000}{40,000} = \text{Rs. } 7.05$$

(d) Price Earning Ratio

$$= \frac{\text{Profit per Equity Share}}{\text{Earning per Share}}$$

$$= \frac{\text{Rs. } 50}{\text{Rs. } 7.05} = 7.09 \text{ times}$$

Problem 2.30. Following is the Balance Sheet and profit and loss Account of Sidhartha Ltd. for the year ending December 31, 1995.

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BALANCE SHEET

as on December 31, 1995

	Rs.		Rs.
Share Capital (Rs. 10 share each)	40,000	Fixed Assets	1,10,000
Reserves and Surples	30,000	Liquid Assets	30,000
Overdraft (short period)	40,000	Other Current Assets	50,000
Current Liabilities	80,000		
	1,90,000		1,90,000

PROFIT AND LOSS ACCOUNT

for the period ending Decembr, 31, 1995

	Rs.		Rs.
Opening Stock	20,000	By Sales	2,80,000
To Purchases	2,20,000	By Closing stock	30,000
To Expenses	30,000		
To Net Profit	40,000		
	3,10,000		3,10,000

You are requird to comment on the general financial condition of the company taking into relevant ratios.

Solution :

Liquidity Ratios

(i) Current Ratio : Current Assets : Current Liabilities

Rs. 80,000 : Rs. 1,20,000 2 : 3

(ii) Quick Ratio : Liquid Assets : Current Liabilities

Rs. 30,0000 : Rs. 1,20,000 1 : 4

Comments

Current financial position of the company is unsatisfactory. Current ratio of 2 : 3 is far below the standard current ratio of 2 : 1. The quick ratio is 1 : 4, this ratio should have been 1 : 1. The company should raise long-term finances either in the form of share capital or long-term loans to improve current financial position.

Solvency Ratios

(i) Proprietory Ratio : Proprietors Funds : Total Assets

Rs. 70,000 : 1,90,000

1 : 2.71

(ii) Fixed Assets to Net Worth : Fixed Assets : Net Worth

Rs. 1,10,000 : Rs. 70,000 : 1.0.636

Comments

Long-term financial position of the company is not very satisfactory. Proprietors' funds are less than half of the total assets and fixed assets are much more than the net worth.

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Profitability

Net Profit to Proprietor's Funds

$$= \frac{\text{Net Profit}}{\text{Proprietor's Funds}} \times 100$$

$$= \frac{40,000}{70,000} \times 100 = 57.14\%$$

Profitability of the company is quite satisfactory.

Problem 2.31. With the help of following ratios and further information given below, complete the Trading Account, Profit and Loss Account and Balance Sheet of Rama and Co. :

Gross Profit Ratio = 20%
Net Profit Ratio = 15%
Sales/Inventory Ratio = 6

$$\text{Fixed Assets/Total Current Assets} = \frac{2}{2}$$

$$\text{Fixed Assets/Total Capital} = \frac{3}{2}$$

$$\text{Capital/Total Outside Liabilities} = \frac{2}{4}$$

Inventory = Rs. 3,00,000
Fixed Assets = Rs. 20,00,000

PROFORMA OF TRADING AND PROFIT AND LOSS ACCOUNT

	Rs.		*Rs*
To cost of sales	.....	By Sales	.....
To Gross Profit c/d.	.....		
	.....		.....
To Expenses	.....	By Gross Profit b/d	.....
To Net Profit	.....		
	.....		.....

PROFORMA OF BALANCE SHEET

Liabilities	*Rs.*	*Assets*	*Rs.*
Capital :		Fixed Assets	
Balance			
Add Net Profit		*Current Assets*	
		Stock	
Total Outside Liabilities		Other Current Assets	
	.....		.....

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Solution :

1. Sales : Sales/Inventory Ratio $= \dfrac{\text{Sales}}{\text{Inventory}}$

$$6 = \frac{\text{Sales}}{\text{Rs. 3,00,000}}$$

$$\text{Sales} = \text{Rs. } 3,00,000 \times 6 = \text{Rs. } 18,00000$$

2. Gross Profit :

$$\text{Gross Profit Ratio} = \frac{\text{G. P.}}{\text{Sales}} \times 100$$

$$20\% = \frac{\text{G. P.}}{\text{Rs. } 18,00,000}$$

$$\text{Gross Profit} = \text{Rs. } 18,00,000 \times \frac{1}{5} = \text{Rs. } 3,60,000$$

3. Cost of Sales : Sales – Gross Profit

Cost of Sales = Rs. 18,00,000 – Rs. 3,60,000 = Rs. 14,40,000

4. Net Profit :

$$\text{Net Profit Ratio} = \frac{\text{N. P.}}{\text{Sales}} \times 100$$

$$15\% = \frac{\text{N. P.}}{\text{Rs. } 18,00,000}$$

$$\text{Net Profit} = \frac{\text{Rs. } 18,00,000 \times 15}{100} = \text{Rs. } 2,70,000$$

5. Expenses :

Gross Profit – Net Profit

Expenses = Rs. 3,60,000 – Rs. 2,70,000 = Rs. 90,000

6. Total Current Assets :

$$\frac{\text{Fixed Assets}}{\text{Total Current Assets}} = \frac{2}{2}$$

$$\frac{\text{Rs. } 20,00,000}{\text{Total Current Assets}} = \frac{2}{2}$$

$$\text{Total Current Assets} = \frac{\text{Rs. } 20,00,000 \times 2}{2}$$

$$= \text{Rs. } 20,00,000$$

7. Total Capital :

$$\frac{\text{Fixed Assets}}{\text{Total Capital}} = \frac{3}{2}$$

$$\frac{\text{Rs. } 20,00,000}{\text{Total Capital}} = \frac{3}{2}$$

Total Capital = Rs. 13,33,333 (approx.)

8. Total Outside Liabilities :

$$\frac{\text{Capital}}{\text{Total Outside Liabilities}} = \frac{2}{4}$$

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$$\frac{\text{Rs. } 13,33,333}{\text{Total Outside Liabilities}} = \frac{2}{4}$$

Total Outside Liabilities = Rs. 26,66,667 (approx.)

PROFORMA OF TRADING AND PROFIT AND LOSS ACCOUNT

	Rs.		*Rs.*
To Cost of Sales	14,40,000	By Sales	18,00,000
Tp Gross Profit c/d	3,60,000		
	18,00,000		18,00,000
To Expenses	90,000	By Gross Profit b/d	3,60,000
To Net Profit	2,70,000		
	3,60,000		3,60,000

PROFORMA OF BALANCE SHEET

Liabilities		*Rs.*	*Assets*		*Rs.*
Capital :			Fixed Assets		20,00,000
Balance	10,63,333				
Add Net Profit	2,70,000		*Current Assets :*		
		13,33,333	Stock	3,00,000	
Total Outside Liabilities		26,66,667	Other Curent Assets	17,00,000	20,00,000
		40,00,000			40,00,000

Problem 2.32. Using the following data, complete the Balance Sheet below :

	Rs.
Gross Profit Ratio (20% of sales)	60,000
Shareholders' Equity	50,000
Credit Sales to total Sales	80%
Total Assets Turnover	3 times
Inventory Turnover (to cost of Sales)	8 times
Average Collection Period (360 days a year)	18 days
Current Ratio	1.6
Long-term debt to Equity	40%

BALANCE SHEET

	Rs.		*Rs.*
Creditors	.....	Cash	.....
Long-term Debt	.....	Debtors	.....
Shareholders' Equity	.....	Inventory	.....
		Fixed Assets	.....
	.....		.....

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Solution :

$$\text{Sales} = 60{,}000 \times \frac{100}{20} = \text{Rs. } 3{,}00{,}000$$

(Gross Profit is 20% of Sales)

$$\text{Credit Sales} = 3{,}00{,}000 \times \frac{80}{100} = \text{Rs. } 2{,}40{,}000$$

$$\text{Cost of goods Sold} = \text{Sales} - \text{Gross Profit}$$
$$= 3{,}00{,}000 - 60{,}000$$
$$= \text{Rs. } 2{,}40{,}000$$

$$\text{Inventory Turnover} = \frac{\text{Cost of Goods Sold}}{\text{Inventory}}$$

$$8 = \frac{2{,}40{,}000}{\text{Inventory}}$$

(i) $$\text{Inventory} = \frac{2{,}40{,}000}{8} = \text{Rs. } 30{,}000$$

$$\text{Average Collection Period} = \frac{\text{Trade Debtors}}{\text{Sales Per Day}}$$

$$\text{Average Collection Period} = \frac{\text{Trade Debtors} \times \text{No. of Working Days}}{\text{Annual Credit Sales}}$$

$$18 = \frac{\text{Trade Debtors}}{2{,}40{,}000} \times 360$$

(ii) $$\text{Trade Debtors} = \frac{2{,}40{,}000 \times 18}{360} = \text{Rs. } 12{,}000$$

$$\text{Total Assets Turnover} = \frac{\text{Sales}}{\text{Total Assets}}$$

$$3 = \frac{3{,}00{,}000}{\text{Total Assets}}$$

(iii) $$\text{Total Assets} = \frac{3{,}00{,}000}{3} = \text{Rs. } 1{,}00{,}000$$

(iv) $$\text{Long-term Debts} = 40\% \text{ of Equity}$$
$$= \frac{50{,}000 \times 40}{100} = \text{Rs. } 20{,}000$$

Since total Assets are Rs. 1,00,000, so total of liabilities side will also be Rs. 1,00,000.

Creditors = Total of liabilities side – (Long-term debt + Shareholders' Equity)
= Rs. 1,00,000 – (20,000 + 50,000) = Rs. 30,000

(v) Creditors = Rs. 30,000

Current Assets = 30,000 × 1.6
= Rs. 48,000

Creditors are treated as total current liabilities.

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(vi) Cash = 48,000 – (30,000 + 12,000)
= 48,000 – 42,000
= Rs. 6,000.

(vii) Fixed Assets = Total Assets – Current Assets
= Rs. 1,00,000 – Rs. 48,000
= Rs. 52,000

BALANCE SHEET

	Rs.		*Rs.*
Creditors	30,000	Cash	6,000
Long-term Debt	20,000	Debtors	12,000
Shareholders' Equity	50,000	Inventory	30,000
		Fixed Assets	52,000
	1,00,000		1,00,000

Problem 2.33. Calculate the balance sheet items given in the undermentioned proforma with help of following ratios :

Total Assets/Net worth 3.5 — Sales/Inventory 15
Sales/Fixed Assets 6 — Sales/Debtors 18
Sales/Current Assets 8 — Current Ratio 2.5
Annual Sales Rs. 25 lakhs

BALANCE SHEET

Liabilities	*Rs.*	*Assets*	*Rs.*
Net worth	.....	Fixed Assets	.....
Long-term Debt	.....	Inventory	
Current Liabilities	.....	Debtors	
		Liquid assets	
		Total Current Assets	.....
Total Liabilities		Total Assets	

Solution :

1. Fixed Assets

$$\frac{\text{Sales}}{\text{Fixed Assets}} = 6$$

$$= \frac{\text{Rs. 25 lakhs}}{\text{Fixed Assets}} = 6$$

$$\text{Fixes Assets} = \frac{\text{Rs. 25 lakhs}}{6} = \text{Rs. } 4,16,667$$

2. Current Assets

$$\frac{\text{Sales}}{\text{Current Assets}} = 8$$

$$\frac{\text{Rs. 25 lakhs}}{\text{Fixed Assets}} = 8$$

$$\text{Current Assets} = \frac{\text{Rs. 25 lakhs}}{8} = \text{Rs. } 3,12,500$$

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3. Debtors

$$\frac{\text{Sales}}{\text{Debtors Assets}} = 18$$

$$\frac{\text{Rs. 25 lakhs}}{\text{Fixed Assets}} = 18$$

$$\text{Debtors} = \frac{\text{Rs. 25 lakhs}}{18} = \text{Rs. } 1,38,889$$

4. Inventory

$$\frac{\text{Sales}}{\text{Inventory}} = 15, \quad \text{or} \quad \frac{\text{Rs. 25 lakhs}}{\text{Inventory}} = 15$$

$$\text{Inventory} = \frac{\text{Rs. 25 lakhs}}{15} = \text{Rs. } 1,66,667$$

5. Current Liabilities

$$= \frac{\text{Current Assets}}{\text{Current Liabilities}} = 2.5$$

$$\frac{\text{Rs. } 3,12,500}{\text{Current Liabilities}} = 2.5$$

$$\text{Current Liabilities} = \frac{\text{Rs. } 3,12,500}{2.5} = \text{Rs. } 1,25,000$$

6. Net Worth

$$\frac{\text{Total Assets}}{\text{Net Worth}} = 3.5$$

$$\frac{\text{Rs. } 7,29,167}{\text{Net Worth}} = 3.5$$

$$\text{Net Worth} = \frac{\text{Rs. } 7,29,167}{3.5} = \text{Rs. } 2,08,333$$

7. Long-term Debts

= Total Assets – (Net Worth + Current Liabilities)
= Rs. 7,29,167 – (Rs. 2,08,333 + Rs. 1,25,000)
= Rs. 7,29,167 – Rs. 3,33,333
Long-term Debts = Rs. 3,95,834

BALANCE SHEET

Liabilities	*Rs. (lakhs)*	*Assets*		*Rs. (lakhs)*
Net Worth	2,08,333	Fixed Assets		4,16,667
Long-term Debts	3,95,834	Inventory	1,66,667	
Current Liabilities	1,25,000	Debtors	1,38,889	
		Liquid Assets	6,944	
		Total Current Assets	3,12,500	3,12,500
	7,29,167			7,29,167

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Problem 2.34. The following data represents the ratios pertaining to X Co. Ltd. for the year ending 31st March, 1996 :

Annual Sales	Rs. 40,00,000
Sales to Net Worth	4 times
Current Liabilities to Net Worth	50%
Total Debts to Net Worth	80%
Current Ratio	2.2 times
Sales to Inventory	8 times
Average Collection period	40 days
Fixed Assets to Net Worth	70%

From the above mentioned particulars, prepare the Balance Sheet of X Co. Ltd as on 31st March 1996. Assume that all sales are made on credit.

(B. Com. G.N.D.U.)

Solution :

(i) Sales to Net Worth = 4 times

$$\frac{\text{Sales}}{\text{Net Worth}} = 4$$

$$\frac{\text{Rs. } 40,00,000}{\text{Net Worth}} = 4$$

$$\text{Net Worth} = \frac{\text{Rs. } 40,00,000}{4} = \text{Rs. } 10,00,000$$

(ii) Total Debt to Net Worth = 80%

$$\frac{\text{Total Debt}}{\text{Net Worth}} = \frac{80}{100}$$

$$\text{Total Debt} = \frac{80}{100} \times 10,00,000 = \text{Rs. } 8,00,000$$

(iii) Current Liabilities to Net Worth = 50%

$$\text{Current Liabilities} = \frac{10,00,000 \times 50}{100} = \text{Rs. } 5,00,000$$

Since Total Debts = Long-term Debts + Current Liabilities

(iv) Long-term Debts = Total Debts – Current Liabilities

= Rs. 8,00,000 – Rs. 5,00,000

= Rs. 3,00,000

(v)

$$\text{Current Ratio} = \frac{\text{Current Assets}}{\text{Current Liabilities}}$$

$$2.2 = \frac{\text{Current Assets}}{5,00,000}$$

Current Assets = 5,00,000 × 2.2 = Rs. 11,00,000

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(vi) $$\text{Inventory Ratio} = \frac{\text{Sales}}{\text{Inventory}}$$

$$8 = \frac{40,00,000}{\text{Inventory}}$$

$$\text{Inventory} = \frac{40,00,000}{8} = \text{Rs. } 5,00,000$$

(vii) Average Collection Period

$$= \frac{\text{Accounts Receivables}}{\text{Sales}} \times 360$$

$$40 = \frac{\text{Accounts Receivables}}{40,00,000} \times 360$$

$$\text{Accounts Receivables} = \frac{40,00,000 \times 40}{360}$$

$$= \text{Rs. } 4,44,444 \text{ (approx.)}$$

(viii) Current Assets = Cash + Inventory + Account Receivables

11,00,000 = Cash + 5,00,000 + 4,44,444

Cash = 11,00,000 – 9,44,444

= Rs. 1,55,556

(ix) Fixed Assets = 70% of Net Worth

$$= \frac{70}{100} \times 10,00,000$$

= Rs. 7,00,000

BALANCE SHEET

Liabilities	*Rs.*	*Assets*	*Rs.*
Net Worth		Fixed Assets	7,00,000
(Proprietor's funds)	10,00,000	*Current Assets :*	
Long-term Debts	3,00,000	Accounts Receivable	4,44,444
Current Liabilities	5,00,000	Inventory	5,00,000
		Cash	1,55,556
	18,00,000		18,00,000

Problem 2.35. The following information relates to the financial statement of Sunrise Ltd. for the year ending Dec. 31, 1994 :

Working capital	Rs. 45,000
Working capital (current) Ratio	2.5 to 1
Acid test Ratio	1.4 to 1
Inventory turnover Ratio (based on average cost of opening and closing inventory)	5 times
Gross Profit Ratio	40%
Earning Per Share	Rs. 1
Earning for the year as percentage of share capital	25%
Debt collection period	36 days
Creditors velocity	54 days

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Number of shares allotted	25,000
(Norminal value Rs. 5 per share)	
Fixed Assets : Shareholders Equity	0.7
Operating Ratio (Operating cost : Sales)	90%

There are no deferred expenses, prepaid expnses, long-term liabilities and intangible assets. Opening stock was less by Rs. 4000 than closing stock.

Prepare company's Profit and loss Account for the year ended 31st Dec. 1994 and Balance Sheet on that date with as many details as possible. Take 360 days in a year.

Solution :

Current Ratio = 2.5 : 1

It Current Liabilities = x then Current Assets = 2.5x

Working Capital = CA – CL

or, 45,000 = 2.5x – x

Or, 1.5x = 45,000

$$\text{Or, } x = \frac{45,000}{1.5} = \text{Rs. } 30,000$$

∴ Current Liabilities = Rs. 30,000

and, Current Assets = Rs. 30,000 × 2.5 = Rs. 75,000

Acid Test Ratio = 1.4 (given)

$$\frac{\text{Quick Assets}}{\text{Quick (Current) Liabilities}} = 1.4$$

∴ Quick Assets = 1.4 × 30,000 = Rs. 42,000

Closing Stock = Current Assets – Quick Assets

= Rs. 75,000 – 42,000

= Rs. 33,000

Opening Stock = Rs. 33,000 – 4,000 = Rs. 29,000

$$\text{Average Stock} = \frac{33,000 + 29,000}{2} = \text{Rs. } 31,000$$

$$\text{Inventory Turnover Ratio} = \frac{\text{Cost of Goods Sold}}{\text{Average Stock}} = 5$$

∴ Cost of Good Sold = 5 × 31,000 = Rs. 1,55,000

Gross Profit Ratio = 40%

∴ If Sales = 100 then G. P. = 40

and Cost of Goods sold = 100 – 40 = Rs. 60.

If Cost of Goods Sold is 60, then sales = 100

and, if cost of goods sold is Rs. 1,55,000, then sales $= \frac{100}{60} \times 1,55,000$ = Rs. 2,58,333

Gross Profit = Sales – Cost of Goods Sold

= 2,58,333 – 1,55,000 = Rs. 1,03,333.

Net Profit = Earnings Per Share × No. of Shares

= Rs. 1 × 25,000 = Rs. 25,000

As, Net Profit is 25% of share Capital,

$$\text{Share Capital} = 25,000 \times \frac{100}{25} = \text{Rs. } 1,00,000$$

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Debt Collection Period = 36 days

$$\text{Debtors} = \frac{\text{Credit Sales}}{360} \times \text{Debt Collection Period}$$

$$= \frac{2,58,333}{360} \times 36 = \text{Rs. } 25,833$$

Creditors Velocity (Average Payment Period) = 54 Days

$$\text{Creditors} = \frac{\text{Credit Purchases}}{360} \times 54$$

Credit Purchases = Cost of Goods Sold – Op. Stock + Cl. Stock
= 1,55,000 – 29,000 + 33,000
= Rs. 1,59,000

$$\therefore \text{ Creditors} = \frac{1,59,000}{360} \times 54 = \text{Rs. } 23,850$$

Fixed Assets : Shareholders Equity = 0.7

If Shareholders' Equity = x, then F. A. = .7x

Now, substituting in B/S Equation

Shareholders' Funds + C. L. = FA + CA

(as there are no deferred expenses, prepaid expenses, long-term liabilities and intangible assets)

$\therefore$ S.F – FA = CA – CL
Or, x – .7x = Rs. 45,000
Or, 0.3x = 45,000

$$\text{Or, } x = 45,000 \times \frac{10}{3} = \text{Rs. } 1,50,000$$

$\therefore$ Shareholders' Equity (Funds) = Rs. 1,50,000
and Fixed Assets = 1,50,000 × 0.7 = Rs. 1,05,000
Shaholders' Funds = Share Capital + Net Profit + Reserves
1,50,000 = 1,00,000 + 25,000 + Reserves
$\therefore$ Reserves = Rs. 25,000
Operating Ratio = 90%

$$\frac{\text{Operating Cost}}{\text{Sales}} = 90\%$$

$$\therefore \text{ Operating Cost} = \frac{90}{100} \times 2,58,333$$

= Rs. 2,32,500
Operating Cost = Cost of Goods Sold + Operating Expenses
2,32,500 = 1,55,000 + Operating Expenses
Or, Operating Expenses = 2,32,500 – 1,55,000
= Rs. 77,500

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TRADING AND PROFIT AND LOSS ACCOUNT

	Rs.		Rs.
To Opening Stock	29,000	By Sales	2,58,333
" Purchases	1,59,000	" Closing Stock	33,000
" Gross Profit	1,03,333		
	2,91,333		2,91,333
		By Gross Profit	1,03,333
To Operating Expenses	77,500		
" Other Expenses	833		
" Net Profit	25,000		
	1,03,333		1,03,333

BALANCE SHEET

Liabilities		Rs.	*Assets*		Rs.
Share Capital		1,00,000	Fixed Assets		1,05,000
Profit and Loss A/c.		25,000	Current Assets :		
Reserves & Surplus		25,000	Stock	33,000	
Current Liabilities :			Debtors	25,833	
Creditors	23,850		Cash (others)	16,167	75,000
Others	6,150	30,000			
		1,80,000			1,80,000

Problem 2.36. Following is the Balance Sheet of Rajindra Ltd. as on 31.12.1994 :

	Rs.		Rs.
Share Capital :		Fixed Assets :	
5,000, 9% Preference		Building	25,000
Shares of Rs. 10 each	50,000	Machinery	1,22,000
5,000 Equity Shares of Rs. 10 each	50,000	Current Assets :	
General Reserve	15,000	Debtors	6,000
Sinking fund Reserve	15,000	Stock	1,50,000
8% Debentures	50,000	Bank	2,000
Creditors	85,000		
Bills Payable	40,000		
	3,05,000		3,05,000

From the balalnce sheet find out (i) Net Worth, (ii) Total Value of Equity, (iii) Shareholders Reserves, (iv) Total Current Assets, (v) Working Capital, (vi) Quick Assets.

Solution :

(i) Net Worth :

Total Assets– Outside Liabilities

Rs. 3,05,000 – (50,000 + 85,000 + 40,000)

Rs. 3,05,000 – Rs. 1,75,000

= Rs. 1,30,000

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(ii) Total Value of Equity :
Net Worth – Preference Share Capital
Rs. 1,30,000 – Rs. 50,000 = Rs. 80,000

(iii) Shareholders Reserves :
General Reserves + Sinking fund Reserve
Rs. 15,000 + Rs. 15,000
= Rs. 30,000

(iv) Total Current Assets :
Debtors + Stock + Bank
Rs. 6,000 + Rs. 1,50,000 + Rs. 2,000
= Rs. 1,58,000

(v) Working Capital :
Current Assets – Current Liabilites
Rs. 1,58,000 – Rs. 1,25,000
= Rs. 33,000

(vi) Quick Assets :
Current Assets – Stock
Rs. 1,58,000 – Rs. 1,50,000
= Rs. 8,000

Problem 2.37. The standard ratios for the industry and the ratios of the company X are given below. Determine the efficieny of the working of the company.

	Industry Standard	Company X
Current Ratio	2.50	1.90
Gross Profit Ratio	0.30	0.35
Fixed Expenses ratio to sales	0.15	0.20
Variable Expenses ratio to sales	0.10	0.08
Sales to Capital	3.00	4.00
Fixed Assets/Long-term Funds	1.00	0.90
Rate of Return on Capital	15%	20%

Solution :

Current ratio of the Company X is less than the standard ratio of the industry *i.e.* 2.5. It shows that the current assets are not sufficient to meet current liabilities. The short-term financial position of the company is not satisfactory.

The gross profit ratio of the company is better than that of the industry. The fixed expenses ratio to sales is 0.15 in industry whereas this ratio is 0.20 in company X. This means that fixed expenses in the company are more. The variable expenses ratio to sales is much higher in the industry as compared to this ratio in the company X. Total expenses are 25% of sales in the industry whereas this ratio is 28% in the company. Net profit available in the industry is 5% and 7% in company X. Company X has better profitability as compared to industry's profitability. The rate of return on capital is quite satisfactory both in industry and in company X but it is certainly better in Company X while comparing it to the industry's standard.

The sales are three times of capital in the industry whereas it is four times in company X. It shows how that sales turnover is better in company X. Fixed assets to long-term funds ratio shows much investment made in fixed assets is financed from long-term funds. In industry, fixed assets are fully financed from long-term funds

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which is a sound financial policy. Company X is having a still better policy and it has not only purchased fixed assets out of long-term funds but is has also used long-term funds for providing working capital.

On the whole the current financial position of the company is not satisfactory whereas it has better profitability as compared to that of the industry.

Problem 2.38. On the basis of the following financial statements, put forward :

(a) Current Ratio *(b)* Quick Ratio

(c) Operating Ratio *(d)* Return on Investment.

Income Statement for 1995

	Rs.
Net Sales	10,00,000
Cost of Goods sold	7,56,000
Operating Expenses	1,25,000
Depreciation	44,000
Income from Investments	1,40,000
Income-tax	65,000

Balance Sheet

as at December 31, 1995

	Dr. Rs.	*Cr.* Rs.
Share Capital		3,00,000
Debentures		2,00,000
Profit after tax		1,50,000
Bills Payable		1,30,000
Sundry Creditors		60,000
Sundry Debtors	45,000	
Bills Receivable	1,60,000	
Stock	1,15,000	
Buildings	2,50,000	
Plant and Machinery	2,10,000	
Cash	35,000	
Investment (inside the business)	80,000	
Provision for taxation		65,000
Outstanding Expenses		5,000
Accrued Income	15,000	
Total	9,10,000	9,10,000

Solution :

$$(a)\ \text{Current Ratio} = \frac{\text{Current Assets}}{\text{Current Liabilities}}$$

$$= \frac{45,000 + 1,60,000 + 1,15,000 + 35,000 + 15,000}{1,30,000 + 60,000 + 65,000 + 5,000}$$

$$= \frac{3,70,000}{2,60,000} = 1.42$$

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(b) Quick Ratio $= \dfrac{\text{Quick Assets}}{\text{Current Liabilities}}$

$= \dfrac{2,55,000}{2,60,000} = 0.98.$

(c) Operating Ratio $= \dfrac{\text{Operating Cost}}{\text{Sales}} \times 100$

$= \dfrac{7,56,000 + 1,25,000}{10,00,000} \times 100$

$= \dfrac{8,81,000}{10,00,000} \times 100 = 88.1\%$

(d) Return on Investment $= \dfrac{\text{Profit before tax}}{\text{Share Capital + Debentures + P \& L A/c.}} \times 100$

$= \dfrac{2,15,000}{6,50,000} \times 100 = 33\%$

Problem 2.39. An analytical statement of AB Company is shown below. It is based on output (sales) level of 80,000 units.

	Rs.
Sales	9,60,000
Variable cost	5,60,000
Revenue before fixed costs	4,00,000
Fixed Costs	2,40,000
	1,60,000
Interest	60,000
Earning before tax	1,00,000
Tax	50,000
Net income	50,000

Calculate the degre of *(i)* Operating Leverage, *(ii)* Financial Leverage, and *(iii)* Combined Leverage.

Solution :

(i) Operating Leverage :

$= \dfrac{\text{Contribution}}{\text{Earning Before Interest and Tax (EBIT)}}$

Contribution = Sales Variable cost

= Rs. 9,60,000 – Rs. 5,60,000 = Rs. 4,00,000

Earnings Before Interest and Tax = Rs. 1,60,000

$$\text{Operating Leverage} = \frac{\text{Rs. } 4,00,000}{\text{Rs. } 1,60,000} = 2.5 : 1$$

(ii) Financial Leverage :

$= \dfrac{\text{Earnings Before Interest and Tax (EBIT)}}{\text{Earnings before Interest \& Tax – Interest \& Preference Dividend}}$

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$$= \frac{\text{Rs. } 1,60,000}{\text{Rs. } 1,60,000 - \text{Rs. } 60,000}$$

$$= \frac{\text{Rs. } 1,60,000}{\text{Rs. } 1,00,000}$$

= 1.6 : 1 (Preference dividend is not given in this case)

(iii) Combined Leverage :

$$= \frac{\text{Contribution}}{\text{Earnings before tax}}$$

$$= \frac{\text{Rs. } 4,00,000}{\text{Rs. } 1,00,000} = 4 : 1$$

Problem 2.40. Selected accounting ratios of two companies in the consumer goods industry are given below :

Ratios	*Company A*	*Company B*
Current Ratio	2.4	2.8
Acid Test Ratio	0.9	0.3
Capital Gearing Ratio $\left(\frac{\text{Equity}}{\text{Debt}}\right)$	2.0	0.5
Return on Total Investment	18%	8%
Gross Profit Ratio	25%	15%
Net Profit Ratio	4%	4%
Investment Turnover	4.5 times	2 times

Comment on the relative performance and financial condition of the two companies.

Solution :

With a view to study the relative performance of the two companies a student has to study profitability ratio and financial condition can be studied from financial ratios.

The gross profit ratio is 25% in company A and 15% in company B. The cost of goods sold in company A is 75% of sales and this ratio is 85% in company B. This shows that company A has better control over factory expenses. The net profit ratio *i.e.* 4% is similar in both the companies. The operating and non-operating expenses are much higher in company A in comparison to company B and it is because of this reason that net profit ratio is same in both the companies. Return on total investment is much better in company A as compared to company B. Despite similar net profit in both the companies, a better rate of return in company A is because of low investments in this company. This conclusion is supported by investments turnover ratio also. Sales are 4.5 times of investment in company A in comparison to 2 times in company B. The performacne of company A is better than that of company B. The capital gearing ratio is also better in company A. This ratio indicates the use of equity share capital in comparison to fixed interest bearing securities. Company A has double the amount of equity share capital and reserves and surplus than the fixed interest bearing securities whereas equity share capital is less than those securities in company B.

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The current ratios of both the companies are better than the usually used standard of 2, this ratio is slightly better in company B. Acid test ratio in company A is almost near to the standard ratio *i.e.* 1 : 1 whereas this ratio is much low in company B. The acid test ratio of 0.3 is very low and the company may face liquidity problem. The difference between current ratio and acid-test ratio represents inventory. Company B has accumulated much more inventory than company A and this is the reason for a wide difference between current ratio and acid test ratio in company B. The liquidity position of company B is very poor ; comparing the financial position of the two companies, company A is better.

Problem 2.41. Calculate the following ratios and give your brief comments :

(a) Liquidity Ratios

(b) Solvency Ratios

(c) Profitability Ratios.

BALANC SHEET OF PUNJAB AUTO LIMITED

as on December 31, 1995

Liabilities		*Rs.*	*Assets*	*Rs.*
Equity share capital		40,000	Goodwill	24,000
Capital Reserve		8,000	Fixed Assets	56,000
8% Loan on Mortgage		32,000	Stock	12,000
Creditors		16,000	Debtors	12,000
Bank Overdraft		4,000	Investments (short-term)	4,000
Taxation :			Cash in hand	12,000
Current		4,000		
Future		4,000		
Profit and Loss Account :				
Profit for 1995 (after-tax and interest on fixed deposits)	24,000			
Less :				
(i) Transfer to Resrves	8,000			
(ii) Dividends	4,000	12,000		
		1,20,000		1,20,000

Sales for the Year amounted to Rs. 2,40,000.

Solution :

(a) Liquidity Ratios :

Under Liquidity Ratios, Following ratios are calculated :

(i) Current Ratio, *(ii)* Quick Ratio, *(iii)* Absolute Liquidity Ratio.

(i) Current Ratio = Current Assets : Current Liabilities

= [12,000 + 12,000 + 4,000 + 12,000] :
(16,000 + 4,000 + 4,000 (current)]

= 40,000 : 24,000

= 1.66 : 1.

(ii) Quick Ratio = Quick Assets : Current Liabilities

= 28,000 : 24,000

= 1.167 : 1

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(iii) Absolute Liquidity Ratio

= Absolute Liquid Assts : Current Liabilities
= 16,000 : 24,000
= .66 : 1.

(b) Solvency Ratios :

Following solvency ratios will be calculated :

(i) Debt equity ratio *(ii)* Proprietory ratio *(iii)* Solvency ratio.

(i) Debt equity ratio $= \frac{\text{Outsiders' funds}}{\text{Shareholders' funds}}$

$= \frac{32,000 + 4,000 + 4,000 + 16,000}{40,000 + 8,000 + 4,000 + 12,000}$

$= \frac{56,000}{64,000} = 0.87$

(ii) Proprietory Ratio = Shareholders' Funds : Total Assets
= 64,000 : 1,20,000
= 0.53 : 1.

(iii) Solvency Ratio = Total Liabilities to Outsiders : Total Assets
= 56,000 : 1,20,000
= .47 : 1.

(c) Profitability Ratios :

Following Profitability Ratios are calculated :

(i) Net Profit Ratio *(ii)* Return on Capital employed *(iii)* Return on Shareholders' funds *(iv)* Return on Equity Capital.

(i) Net Profit Ratio $= \frac{\text{Net Profit after tax}}{\text{Net Sales}} \times 100$

$= \frac{24,000}{2,40,000} \times 100 = 10\%$

(ii) Return on Gross-Capital Employed

$= \frac{26,560}{92,000} \times 100 = 28.88\%$

(iii) Return on shareholders' Funds

$= \frac{\text{Net Profit after interest and tax}}{\text{Shareholders' Funds}} \times 100$

$= \frac{24,000}{64,000} \times 100 = 37.5\%$

(iv) Return on Equity Capital

$= \frac{\text{Profit after tax and interest}}{\text{Equity Share Capital}} \times 100$

$= \frac{24,000}{40,000} \times 100 = 60\%$

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Problem. 2.42. M/s. Raj and Sons Ltd. present you the following :

BALANCE SHEET

as on 31st December, 1995

	Rs.		Rs.
Equity Share Capital	50,000	Fixed Assets	87,500
8% Preference Share Capital	10,000	Bills Receivable	25,000
Reserve Fund	40,000	Stock	30,000
6% Debentures	20,000	Sundry Debtors	13,500
Sundry Creditors	30,000	Bank Balance	7,000
Profit and Loss Account		Preliminary Expenses	8,000
1994 1,000			
1995 20,000			
	21,000		
	1,71,000		1,71,000

The directors intend to transfer a sum of Rs. 5,000 out of the current year profit to provision for tax.

You are required to calculate the following ratios :

(a) Return on capital employed ratio

(b) Current ratio

(c) Fixed assets to net worth

(d) Debt to equity capital

(e) Return on owner's capital.

Solution :

Raj and Sons Ltd.

Working Capital

Current assets	*Rs.*	
Bank balance	7,000	
Sundry debtors	13,500	
Stock	30,000	
B/R	25,000	
		Rs. 75,500
Current Liabilities		
Sundry creditors	30,000	
Provision for taxation	5,000	Rs. 35,000

Working Capital = Current Assets – Current Liabilities

= 75,500 – 35,000 = 40,500

Shareholders' Equity	Rs.
Fixed Assets	87,500
Working Capital	40,500
Total funds employed	1,28,000
Less 6% Debentures	20,000
Shareholders' Equity	1,08,000

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Represented by :

	Equity share capital		50,000
	Preference share capital		10,000
	Reserves		40,000
	P and L A/c.		21,000
			1,21,000
Less :	Preliminary expenses	8,000	
	Provision for taxation	5,000	13,000
			1,08,000

(a) Return on Capital Employed Ratio :

		Rs.
	Net Profit for 1995	20,000
Add :	Interest on debentures	1,200
		21,200
Less :	Provision for tax	5,000
	Adjusted profit after tax	16,200

$$\text{Return} = \frac{16,200}{1,28,000} \times 100 = 12.7\%$$

(b) Current ratio :

$$= \frac{\text{Current Assets}}{\text{Current Liabilities}}$$

$$= \frac{\text{Rs. } 75,500}{\text{Rs. } 35,000} = 2.16 : 1$$

(c) Fixed assets to net worth :

$$= \frac{\text{Fixed assets}}{\text{Net worth}}$$

$$= \frac{\text{Rs. } 87,500}{\text{Rs. } 1,08,000} = .81 : 1$$

(d) Debt to equity capital :

$$= \frac{\text{Debt}}{\text{Equity capital}}$$

$$= \frac{\text{Rs. } 20,000}{\text{Rs. } 50,000} = .4 : 1$$

(e) Return on owner's capital :

$$= \frac{\text{Profits available for owners}}{\text{Owner's capital}}$$

$$= \frac{\text{Rs. } 20,000 - 5,000}{\text{Rs. } 50,000 + 10,000} \times 100$$

$$= \frac{15,000}{60,000} \times 100 = 25\%$$

Problem 2.43. Rearrange the following statements in a form suitable for analysis and calculate five ratios which are significant in analysing the financial trend of the business.

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Condensed Balance Sheet

	1995 Rs.	*1996* Rs.
Assets		
Cash at bank	15,380	26,020
Trade Debtors	11,260	11,710
Stock	56,160	49,460
Fixed Assets *less* depreciation	2,17,200	2,19,810
	3,00,000	3,07,000
Liabilities and capital		
Creditors	20,000	16,000
Bills payable	12,750	6,500
Debentures	1,00,000	1,00,000
Reserves and Surplus	67,250	84,500
Paid-up Capital	1,00,000	1,00,000
	3,00,000	3,07,000
Sales	1,80,000	1,95,000

Note : Calculate to the interest second decimal place.

Solution :

Rearrangement of the Statement

STATEMENT OF CAPITAL EMPLOYED

	1995		*1996*	
Assets				
Current Assets :				
Cash at bank	15,380		26,020	
Trade Debtors	11,260		11,710	
		26,640		37,730
Liquid Assets				
Stock		56,160		49,460
Total Current Assets		82,800		87,190
Less : Current Liabilities				
Creditors	20,000		16,000	
Bills Payable	12,750	32,750	6,500	22,500
Working Capital		50,050		64,690
Fixed Assets *less* Depreciation		2,17,200		2,19,810
Capital Employed (Net)		2,67,250		2,84,500
Capitalisation				
Funded debt :				
Debentures		1,00,000		1,00,000
Net worth (Proprietors Funds)				
Paid-up capital	1,00,000		1,00,000	
Reserves & Surplus	67,250		84,500	
		1,67,250		1,84,500
Capital Employed (Net)		2,67,250		2,84,500
Sales		Rs. 1,80,000		Rs. 1,95,000

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Five Significant Ratios

(i) Current Ratio $= \dfrac{\text{Current Assets}}{\text{Current Liabilities}}$

1995 $= \dfrac{82,800}{32,750} = 2.53 : 1.$

1996 $= \dfrac{87,190}{22,500} = 3.88 : 1.$

(ii) Quick Ratio $= \dfrac{\text{Quick or Liquid Assets}}{\text{Current Liabilities}}$

1995 $\dfrac{26,640}{32,750} = 0.81 : 1.$

1996 $\dfrac{37,730}{22,500} = 1.6 : 1$

(iii) Debt to Equity Ratio $= \dfrac{\text{Outsiders' funds}}{\text{Shareholders' funds}}$

1995 $= \dfrac{1,32,750}{1,67,250} = .79 : 1.$

1996 $= \dfrac{1,22,500}{1,84,250} = .66 : 1.$

(iv) Fixed Assets to total Capitalisation

$= \dfrac{\text{Fixed Assets}}{\text{Total Capitalisation}}$

1995 $\dfrac{2,17,200}{2,67,250} \times 100 = 81\%$

1996 $\dfrac{2,19,500}{2,84,250} \times 100 = 77\%$

(v) Net Worth Turnover $= \dfrac{\text{Sales}}{\text{Net Worth}}$

1995 $= \dfrac{1,80,000}{1,67,250} = 1.08$ Times

1996 $= \dfrac{1,95,000}{1,84,250} = 1.06$ Times

Problem 2.44. The financial statements of Good Luck Limited, for the year 1995, reveal the following information :

Ratio of Current Assets to Current Liabilities	1.75 to 1
Liquidity Ratio (Debtors and bank balance to Current Liabilities)	Rs. 1.25 to 1
Issued Capital in equity shares of Rs. 10 each	1,20,000
Net Current Assets (as over Current Liabilities)	60,600

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Fixed Assets (net block) – Percentage of shareholders' equity as on the closing date	60%
Gross Profit (Percentage of turnover)	20%
Annual rate of return of stock (based on Cost on 31-12-1995)	5.26 times
Average age of outstanding debtors for the year 1995	2 months
Net profit percentage on issued share capital	16%

On 31st December, 1995 Current assets consist of stock, debtors and bank balances. You are required to prepare :

1. The Balance Sheet as on 31st December, 1995
2. The Trading and profit and Loss Account for the year ended 31st December, 1995. (C. A. Final)

Solution :

Current Ratio = Current Assets : Current Liabilities
= 1.75 : 1

$$\text{Current Liabilities} = 60{,}600 \times \frac{1}{0.75} = \text{Rs. } 80{,}800$$

$$\text{Current Assets} = \text{Rs. } 60{,}600 \times \frac{1.75}{0.75} = \text{Rs. } 1{,}41{,}400$$

$$\text{Liquid Assets} = \text{Rs. } 60{,}600 \times \frac{1.25}{0.75} = \text{Rs. } 1{,}01{,}000$$

Inventory = Current Assets – Liquid Assets
= 1,41,400 – 1,01,000 = Rs. 40,400

Shareholders' Equity = Fixed Assets + Net Current Assets
= 60% + 40% (residue)

Net Current Assets = 60,600 (given)

$$\text{Fixed Assets} = \text{Rs. } 60{,}600 \times \frac{6}{4} = \text{Rs. } 90{,}900$$

Shareholders' Equity = Rs. 60,600 + Rs. 90,900
= Rs. 1,51,500

Reserves and Surpluses = Shareholders' Equity – Issued Equity Capital
= Rs. 1,51,500 – Rs. 1,20,000
= Rs. 31,500

Cost of Sales = Stock Turnover × Inventory
= 5.26 × Rs. 40,000
= Rs. 2,12,504

Gross Profit = 20% on sales or 25% on Cost of sales

$$= \frac{25}{100} \times 2{,}12{,}504$$

= Rs. 53,126

Sales = Cost of goods sold + Gross Profit
= Rs. 2,12,504 + Rs. 53,126
= Rs. 2,65,630

$$\text{Debtors} = 2{,}65{,}630 \times \frac{2}{12} = \text{Rs. } 44{,}272$$

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Net Profit = 16% on issued capital

$$= \frac{16}{100} \times \text{Rs. } 1,20,000 = \text{Rs. } 19,200$$

Overheads = Gross Profit – Net Profit

= Rs. 53,126 – Rs. 19,200

= Rs. 33,926

SUMMARISED TRADING AND PROFIT AND LOSS ACCOUNT

for the year ended Dec. 31, 1995

	Rs.		Rs.
To Cost of Sales	2,12,504	By Sales	2,65,630
" Gross Profit c/d	53,126		
	2,65,630		2,65,630
To Overheads	33,926	By Gross Profit b/d	53,126
" Net Profit	19,200		
	53,126,		53,126

BALANCE SHEET

as on Dec. 31, 1995

		Rs.			Rs.
Shareholders' Funds			Fixed Assets		90,000
Equity Share Capital	1,20,000		Current Assets :		
			Inventory	40,400	
Reserves & Surpluses			Debtors	44,272	
including N. P. Rs. 19,200)	31,500	1,51,500	Cash/Bank		
Current Liabilities		80,800	(Balancing Figure)	56,728	1,41,400
		2,32,300			2,32,300

Problem 2.45 The following information was taken from the books of XYZ Co :

Acid-Test Ratio = .92

Average Finished Goods Inventory = Rs. 52,000

Average number of days Sales uncollected = 77

Expenses = Rs. 2,12,000

Finished Goods turnover = 12.20

Ratio of Net Income to average total current assets = 9.80%

Net Sales = Rs. 9,00,000

Total Current Assets = Rs. 4,25,000

Working capital turnover = 4.5

You are required to find out :

(a) Working Capital Ratio (Current Ratio)

(b) Total Quick Assets

(c) Accounts Receivable at the end of the year

(d) Turnover of average total current assets.

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Solution :

(a) Working Capital Ratio :

$$\text{Working Capital Turnover} = \frac{\text{Net Sales}}{\text{Working Capital}}$$

$$\text{Working Capital} = \frac{\text{Net Sales}}{\text{Working Capital Turnover}}$$

$$= \frac{9,00,000}{4.50} = \text{Rs. } 2,00,000$$

Since Working Capital = Current Assets – Currrent Liabilities

So, Current Liabilties = Current Assets – Working Capital

= Rs. 4,25,000 – 2,00,000

= Rs. 2,25,000

$$\text{So, Working Capital Ratio} = \frac{\text{Current Assets}}{\text{Current Liabilities}}$$

$$= \frac{4,25,000}{2,25,000} = 1.89 : 1$$

(b) Total Quick Assts :

$$\text{Acid Test Ratio} = \frac{\text{Quick Assets}}{\text{Current Liabilities}}$$

Quick Assets = Acid Test Ratio × Current Liabilities

= 0.92 × 2,25,000

= Rs. 2,07,000

(c) Accounts Receivable at the end of the year :

Average number of days' sales uncollected

$$= \frac{\text{Accounts Receivable}}{\text{Net Sales}} \times 360$$

So, Accounts Receivable

$$= \frac{\text{Net Sales} \times \text{Average number of days sales uncollected}}{360}$$

$$= \frac{9,00,000 \times 77}{360} = \text{Rs. } 1,92,500$$

(d) Turnover of Average Total Current Assets :

(i) $\text{Finished Goods Turnover} = \frac{\text{Cost of goods sold}}{\text{Average Inventory}}$

Or, Cost of goods sold = Finished Goods Turnover × Average Inventory

= 12.20 × 52,000

= Rs. 6,34,400

(ii) Net Income = Net Sales – (Cost of goods sold + Expenses)

= Rs. 9,00,000 – (Rs. 6,34,400 + Rs. 2,12,000)

= Rs. 53,600

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(iii) Ratio of Net Income to Average Total Current Assets

$$= \frac{\text{Net Income}}{\text{Average Total Current Assets}}$$

Average Total Current Assets

$$= \frac{\text{Net Income}}{\text{Average of Net Income to Average Total Current Assets}}$$

$$= \frac{53,600}{9.80} \times 100 = \text{Rs. } 5,46,940$$

Hence, Turnover of Average Total Current Assets

$$= \frac{\text{Net Sales}}{\text{Average Total Current Assets}}$$

$$= \frac{9,00,000}{5,46,940} = 1.65 \text{ times}$$

Problem 2.46. You are given the following figures worked out from the Profit and Loss Account and Balance Sheet of Zed Ltd. relating to the year 1996. Prepare the Balance Sheet.

Fixed assets (after writing off 30%)	Rs. 10,50,000
Fixed Assets Turnover Ratio	2
Finished Goods Turnover Ratio	6
Rate of Gross Profit to Sales	25%
Net Profit (before interest) to Sales	8%
Fixed Charges Cover (Debenture interest 7%)	8
Debt Collection Period	$1\frac{1}{2}$ months
Materials consumed to sales	30%
Stock of raw materials (in terms of number of month's consumption)	3
Current Ratio	2.4
Quick Ratio	1.0
Reserves to Capital	0.21
	(Adopted)

Solution :

(i) Fixed Assets Turnover Ratio

$$= \frac{\text{Cost of Sales}}{\text{Fixed Assets}}$$

$$2 = \frac{\text{Cost of Sales}}{\text{Rs. } 10,50,000}$$

Cost of Sales = Rs. 10,50,000 × 2 = Rs. 21,00,000

(ii) Finished Goods Stock

$$= \frac{\text{Cost of Sales}}{\text{Finished Goods Turnover Ratio}}$$

$$= \frac{\text{Rs. } 21,00,000}{6} = \text{Rs. } 3,50,000$$

(iii) Total Sales = Rs. 21,00,000 × $\frac{100}{75}$ = Rs. 28,00,000

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(iv) Book Debts $= \dfrac{\text{Rs. } 28,00,000 \times 1\frac{1}{2}}{12} = \text{Rs. } 3,50,000$

(v) Materials Consumed $= \dfrac{\text{Rs. } 28,00,000 \times 30}{100} = \text{Rs. } 8,40,000$

(vi) Stock of Raw Materials $= \dfrac{\text{Rs. } 8,40,000 \times 3}{12}$

$= \text{Rs. } 2,10,000$ (3 months consumption)

(vii) Rate of Stock of Current Liabilities

$= 2.4 - 1.0 = 1.4$

Stock of Raw Materials and Finished Goods

$= \text{Rs. } 3,50,000 + \text{Rs. } 2,10,000$

$= \text{Rs. } 5,60,000$

Hence, Current Liabilities $= \dfrac{\text{Rs. } 5,60,000}{1.4} = \text{Rs. } 4,00,000$

$$\text{Quick Ratio} = \frac{\text{Quick Assets}}{\text{Current Liabilities}}$$

$$1.0 = \frac{\text{Quick Assets}}{\text{Rs. } 4,00,000}$$

Quick Assets $= \text{Rs. } 4,00,000 \times 1 = \text{Rs. } 4,00,000$

Current Assets $= \text{Rs. } 4,00,000 \times 2.4 = \text{Rs. } 9,60,000$

Cash in hand $= \text{Rs. } 9,60,000 - (5,60,000 + \text{Rs. } 3,50,000)$

$= \text{Rs. } 50,000$

(viii) $\text{Net Profit} = \dfrac{\text{Rs. } 28,00,000 \times 8}{100} = \text{Rs. } 2,24,000$

$$\text{Fixed charges cover} = \frac{\text{Net Profit}}{\text{Fixed Charges}}$$

$$8 = \frac{\text{Rs. } 2,24,000}{\text{Fixed Charges}}$$

$$\text{Fixed Charges} = \frac{\text{Rs. } 2,24,000}{8} = \text{Rs. } 28,000$$

Fixed changes in this case are interest on debentures. So, debentures should be :

$$\frac{\text{Rs. } 28,000 \times 100}{7} = \text{Rs. } 4,00,000$$

(ix) Capital and reserves will be balancing figure and their ratio is 100 : 21

(x) Fixed Assets Cost

$$= \frac{10,50,000 \times 100}{70} = \text{Rs. } 15,00,000$$

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BALANCE SHEET OF ZED LTD.

as on December, 31, 1996

Liabilities	*Rs.*	*Assets*	*Rs.*	
Capital	10,00,000	Fixed Assets at cost	15,00,000	
Reserves	2,10,000	*Less* Depreciation	4,50,000	
7% Debentures	4,00,000			10,50,000
Current Liabilities	4,00,000	*Current Assts :*		
		Stock of Raw Materials		2,10,000
		Stock of Finished Goods		3,50,000
		Book Debts		3,50,000
		Cash		50,000
	20,10,000			20,10,000

Problem 2.47. Following items appear in the accounts of Operations Limited as on 31st December, 1994

	Rs.
Cash	48,600
Land and Building at cost	8,00,000
Deposits and payments in advance	62,000
Stock	3,72,800
Trade Creditors	4,05,750
General Reserve	1,00,000
Debtors	5,23,000
Bills Receivable	22,600
Plant & Machinery at cost *less* depreciation	5,44,000
5% Debentures Repayable 1999 (Secured)	2,50,000
Bank overdraft	52,000
Equity Shares of Re. 1 each	10,00,000
Profit and Loss Account Balance	2,17,000
Proposed Dividend for 1994 (net)	86,250
Trade Investments	20,000
Provision for taxation	1,24,000
Dividend Reserve	1,40,000
Bills Payable	18,000
Net sales for the year 1994	21,82,400
Net profit for the year 1994 before taxation and dividends	3,27,830

The value of all fixed assets reflects current price levels and adequate depreciation has been provided.

You are required to arrange the above items in the form of a financial statement to show the following accounting ratios which should be stated :

(a) Return on Net Capital Employed

(b) Stock : Fixed Assets

(c) Current Assets : Current Liabilities

(d) Sales : Debtors and Receivables. *(C. A. Final)*

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Solution :

Operations Limited
SATEMENT OF CAPITAL EMPLOYED
as on 31st December, 1994

			Rs.
Share Capital			10,00,000
General Reserve			1,00,000
Dividend Reserve			1,40,000
Profit and Loss Account			2,17,000
Sharholders' funds			14,57,000
Debentures (1999)			2,50,000
Capital Employed			17,07,000
Investment of Funds			
Fixed Assets		*Rs.*	*Rs.*
Land and Building		8,00,000	
Plant and Machinery		5,44,000	13,44,000
Trade Investments			20,000
Current Assets			
Stock	3,72,800		
Trade Debtors	5,23000		
Bills Receivables	22,600		
Deposits and Payments in Advance	62,000		
Cash	48,600	10,29,000	
Less : Current Liabilities			
Trade Creditors	4,05,750		
Bank Overdraft	52,000		
Bills Payable	18,000		
Provision for Taxation	1,24,000		
Proposed Dividend	86,250		
		6,86,000	
			3,43,000
			17,07,000

(a) Return on Capital Employed

$$= \frac{\text{Profit before tax and interest}}{\text{Average Capital Employed}} \times 100$$

$$= \frac{\text{Rs. } 3,27,830 + \text{Rs. } 12,500}{\text{Rs. } 15,43,085} \times 100 = 22.05\%$$

Interest on debentures is taken at 5%, *i.e.*

$$\frac{5 \times 2,50,000}{100} = \text{Rs. } 12,500$$

Average Capital Employed is Calculated as follows :

	Rs.
Capital Employed on 31st Dec. 1994	17,07,000
Less : 50% of net profit (Rs. 3,27,830) earned during the year	1,63,915
	15,43,085

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(b) Stock : Fixed Assets Ratio

$$= \frac{\text{Stock}}{\text{Fixed Assets}} \times 100$$

$$= \frac{\text{Rs. } 3,72,800}{\text{Rs. } 13,44,000} \times 100 = 2.774 \times 100 = 27.74\%.$$

(c) Current Ratio

$$= \frac{\text{Current Assets}}{\text{Current Liabilities}} \times 100$$

$$= \frac{\text{Rs. } 10,29,000}{\text{Rs. } 6,86,000} \times 100$$

$$= 150\%$$

(d) Sales : Debtors and Receivable Ratio

$$= \frac{\text{Net Sales}}{\text{Debtors + Receivables}} \times 100$$

$$= \frac{\text{Rs. } 21,82,400}{\text{Rs. } 5,23,000 + \text{Rs. } 22,600} \times 100$$

$$= \frac{\text{Rs. } 21,82,400}{\text{Rs. } 5,45,600} \times 100$$

$$= 400\%.$$

Problem 2.48. Mercantile Limited has ben in existence for two years. The most important facts from its published accounts are given below :

BALANCE SHEET

at year end

Liabilities	*First year Rs.*	*Second year Rs.*	*Assets*	*First year Rs.*	*Second year Rs.*
Equity shares of Rs. 100 ach	2,00,000	2,00,000	Fixed Assets (less dep.)	4,16,000	3,96,000
Reserve	20,000	40,000	Stocks	60,000	1,20,000
Profit and Loss A/c.	28,000	4,000	Debtors	80,000	1,60,000
Loan on Mortgage	2,20,000	1,60,000	Cash and Bank Balance	60,000	4,000
Bank overdraft	—	40,000			
Creditors	60,000	1,80,000			
Provision for taxation	68,000	26,000			
Proposed Dividend	20,000	30,000			
	6,16,000	6,80,000		6,16000	6,80,000

PROFIT AND LOSS ACCOUNT

for two years

	First Year	*Second Year*		*First Year*	*Second Year*
	Rs.	*Rs.*		*Rs.*	*Rs.*
Interest on Mortgage	4,800	9,600	Balance b/d		28,000
Director's Remuneration	20,000	60,000	Profit for the year after depreciation	1,60,800	1,21,600
Provision for taxation	68,000	26,000			

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Dividends	20,000	30,000		
Transfer to Reserve	20,000	20,000		
Balance	28,000	4,000		
	1,60,800	1,49,600	1,60,800	1,49,600

You are told that the total sales amounted to Rs. 12,00,000 in the first year and Rs. 10,00,000 in th second year.

Examine the above details from the point of view of :

1. Profitability, 2. Solvency Position, 3. Sales, 4. Capital Strcuture.

Solution :

1. Profitability Ratios

For calculating profitability ratios the following calculations are essential :

Net Profit :

			First year	*Second year*
			Rs.	*Rs.*
Net profit before interest and tax :				
Profit for the year			1,60,800	1,21,600
Less : Dirctors' remuneration			20,000	60,000
			1,40,800	61,600
(b) Net profit after interest and tax			1,60,800	1,21,600
Less : Directors' remuneration	20,000		60,000	
Interest on mortgage	4,800		9,600	
Provision for taxation	68,000			
			26,000	
		92,800		95,600
		68,000		26,000
Capital Employed				
Share Capital		2,00,000		2,00,000
Reserves		20,000		40,000
Profit and Loss a/c.		28,000		4,000
Shareholder's Funds		2,48,000		2,44,000
Loan on Mortgage		2,20,000		1,60,000
Net Capital Employed		4,68,000		4,04,000

(i) Net Profit Ratio :

$$\frac{\text{Net Profit}}{\text{Sales}} \times 100$$

First year : $\frac{68,000}{12,00,000} \times 100 = 5.66\%$

Second year : $\frac{26,000}{10,00,000} \times 100 = 2.6\%$

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(ii) Return on Gross Capital Employed :

$$\frac{\text{Net Profit before interest and tax}}{\text{Total Assets}} \times 100$$

$$\text{First year} = \frac{1,40,800}{6,16,000} \times 100 = 22.85\%$$

$$\text{Second year} : \frac{61,600}{6,80,000} \times 100 = 9.06\%$$

(iii) Return on Net Capital Employed :

$$\frac{\text{Net Profit before interest and tax}}{\text{Net Capital Employed}} \times 100$$

$$\textit{First year} : \frac{1,40,800}{4,68,000} \times 100 = 30.08\%$$

$$\textit{Second year} : \frac{61,600}{4,04,000} \times 100 = 15.247\%$$

(iv) Return on Equity capital

$$= \frac{\text{Net Profit before interest and tax}}{\text{Equity Share Capital}} \times 100$$

$$\text{First year} : \frac{68,000}{2,00,000} \times 100 = 34\%$$

$$\text{Second year} : \frac{26,000}{2,00,000} \times 100 = 13\%$$

2. **Solvency Ratios**

(a) Short-term Solvency Ratios

(i) $\text{Current Ratio} = \dfrac{\text{Current Assets}}{\text{Current Liabilities}}$

$$\text{First year} = \frac{60,000 + 80,000 + 60,000}{60,000 + 68,000 + 20,000} = \frac{2,00,000}{1,48,000} = 1.35 : 1$$

$$\text{Second year} = \frac{1,20,000 + 1,60,000 + 4,000}{40,000 + 1,80,000 + 26,000 + 30,000}$$

$$= \frac{2,84,000}{2,76,000} = 1.028 : 1$$

(ii) $\text{Acid-Test Ratio} = \dfrac{\text{Quick Assets}}{\text{Current Liabilities}}$

$$\text{First year} = \frac{80,000 + 60,000}{1,48,000} = \frac{1,40,000}{1,48,000} = .95 : 1$$

$$\text{Second year} = \frac{1,60,000 + 4,000}{2,76,000} = \frac{1,64,000}{2,76,000} = .59 : 1$$

(b) Long-term Solvency Ratios

(i) Debt-Equity Ratio $= \dfrac{\text{Outsiders' Funds}}{\text{Proprietors' Funds}}$

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$$\text{First year} = \frac{2,20,000 + 60,000 + 68,000 + 20,000}{2,20,000 + 20,000 + 28,000}$$

$$= \frac{3,68,000}{2,48,000} = 1.48 : 1$$

$$\text{Second year} = \frac{1,60,000 + 40,000 + 1,80,000 + 26,000 + 30,000}{2,00,000 + 40,000 + 4,000}$$

$$= \frac{4,36,000}{2,44,000} = 1.79 : 1$$

(ii) Proprietory Ratio $= \frac{\text{Shareholders' Funds}}{\text{Total Assets}}$

$$\text{First year} = \frac{2,48,000}{6,16,000} = .402 : 1$$

$$\text{Second year} = \frac{2,44,000}{6,80,000} = .358 : 1$$

(iii) Interest Coverage Ratio $= \frac{\text{Net profit before interest and tax}}{\text{Interest on Loans}}$

$$\text{First year} = \frac{1,40,800}{4,800} = 29.3 \text{ times}$$

$$\text{Second year} = \frac{61,600}{9,600} = 6.42 \text{ times}$$

3. Sales Ratios

(i) Average Collection Period $= \frac{\text{Total Debtors} \times \text{No. of working days}}{\text{Net Credit Sales}}$

$$\text{First year} = \frac{80,000 \times 360}{12,00,000} = 24 \text{ days}$$

$$\text{Second year} = \frac{1,60,000}{10,00,000} \times 360 = 57.6 \text{ days or } 58 \text{ days}$$

(ii) Stock Turnover Ratio $= \frac{\text{Net Sales}}{\text{Stock}}$

$$\text{First year} = \frac{12,00,000}{60,000} = 20 \text{ times}$$

$$\text{Second year} = \frac{10,00,000}{90,000} = 11 \text{ times}$$

Note : In second year, average stock is taken

$$i.e. \frac{60,000 + 1,20,000}{2} = 90,000$$

(iii) Turnover of Total Assets $= \frac{\text{Net Sales}}{\text{Total Assets}}$

$$\text{First year} = \frac{12,00,000}{6,16,000} = 1.94 : 1$$

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$$\text{Second year} = \frac{10,00,000}{6,80,000} = 1.47 : 1$$

4. Capital Structure

$$\textit{(i) Capital Gearing Ratio} = \frac{\text{Proprietors' Funds}}{\text{Fixed Income Bearing Securities}}$$

$$\text{First year} = \frac{2,48,000}{2,20,000} = 1.127 : 1$$

$$\text{Second year} = \frac{2,44,000}{1,60,000} = 1.52 : 1$$

(i) Ratio of Total Investment to long-term Liability

$$= \frac{\text{Net Capital Employed}}{\text{Long-term Liabilities}}$$

$$\text{First year} = \frac{4,68,000}{2,20,000} = 2.13 : 1$$

$$\text{Second year} = \frac{4,04,000}{1,60,000} = 2.52 : 1$$

Problem 2.49. What conclusions would you draw from the following ratios with regard to the financial position of a firm ?

		1994	1995
(a)	Ratio between current liabilities and current assets	1 : 2.1	1 : 1.7
(b)	Ratio between current liabilities and quick assets	1 : 1.1	1 : 1.2
(c)	Ratio of gross profit to sales	1 : 4.5	1 : 3.5
(d)	Ratio of net profit to sales	1 : 6.5	1 : 8.5

Solution :

Short-term Financial Position. The following conclusions can be drawn from the current and quick ratios about short-term financial position of the firm :

1. The current ratio of the firm has declined from 2.1 to 1.7 which shows that the ability of the firm to meet its current liabilities has gone down. The current ratio for 1994 is more than the standard ratio *i.e.* 2, but it has decreased by 0.4 in 1995.

2. The quick ratio of the firm is more than the normally used standard which is 1 : 1, in both years. Despite the fact that current ratio declined in 1995, quick ratio has shown some improvement in 1995 as compared to 1994. The firm's liquid assets are sufficient to meet current liabilities.

3. The comparison of current ratios to liquid ratios shows that investments in stocks are less in the year 1995 than in the year 1994. In shows that be company's liquidity position has improved.

The general short-term financial position of the company is almost satisfactory.

Profitability. The profitability of the company can be better discussed by calculating a percentage of profit to sales. So the percentage of profit will be as under:

	1994	1995
Gross Profit Ratio	$\frac{1}{4.5} \times 100 = 22.2\%$	$\frac{1}{3.5} \times 100 = 28.6\%$
Net Profit Ratio	$\frac{1}{6.5} \times 100 = 15.4\%$	$\frac{1}{8.5} \times 100 = 11.8\%$

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The gross profit has increased in 1995 by 6.4% which means that the firm has kept its cost of sales under control. The net profit has decreased in 1995 as compared to 1994. The decrease in net profit even after the increase in gross profit means that the firm has not been able to control its non-productive expenses. The increase in non-productive expenses is not jutified at all. Unless these expenss are controlled the firm will face losss in the near future.

Problem 2.50. The folowing is the Balance Sheet as on 31st March 1997 of Triple Five Limited. From the details you are required to determine the return on gross investment and return on net investment for reproting to management of Triple Five Limited.

BLANCE SHEET

Liabilities	*Rs.*	*Assets*	*Rs.*
Equity Share Capital	50,000	Goodwill	5,000
$5\frac{1}{2}$ % Pref. Share Capital	25,000	Patents & Trade Marks	1,250
General Reserve	5,000	Buildings (Cost 37,500)	31,250
Creditors	12,500	Plant (cost 50,000)	37,500
Income-tax (current year)	2,500	Stock	10,000
		Debtors	8,750
		Cash at Bank	1,250
	95,000		95,000

1. The current value of patents and trade marks is 2,500.
2. The following assets are currently valued at replacement cost.

	Rs.
Building	37,500
Plant	50,000

3. The current value of stock is estimated at Rs. 15,000. There is a sum of Rs. 1,250 included in the value which has to be written off due to obsolescence.
4. The profit for the current year is Rs. 20,000.
5. Depreciation written off, and included in this profit, on plant & buildings is Rs. 7,500.
6. Goodwill has been written off, at Rs. 500 and included in this current year's profit.

(**Note :** Depreciation rate may be taken to be 5% for building and 10% on plant and machinery.)

Solution :

Calculation of Capital Employed

	Rs.
Patents & Trade Marks	2,500
Buildings at replacement cost	37,500
Plant at replacement cost	50,000
Stock [10,000 – 1,250 (obsolete)]	8,750
Debtors	8,750
Cash	1,250
Gross Capital Employed	1,08,750

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Net Capital Employed = Gross Capital Employed – Current Liabilities
= Rs. 1,08,750 – 15,000
= Rs. 93,750

Current Liabilities = Creditors Rs. 12,500 + Income-tax Rs. 2,500
= Rs. 15,000

Calculation of Adjusted Profit

	Pofit after charging depreciation and writing off goodwill		20,000
Add :	Goodwill		500
			20,500
Less :		Rs.	
Loss on obsolete stock		1,250.00	
Additional Depreciation :			
Building 5% of Rs. 6250		3,13.50	
Plant 10% of 12,500		1,250.00	2,812.50
Return on Gross Capital Employed			17,687.50

$$= \frac{\text{Adjusted Net Profit}}{\text{Gross Capital Employed}} \times 100$$

$$= \frac{17,687.50}{1,08,750} \times 100 = 16.26\%$$

Return on Net Capital Employed

$$= \frac{\text{Adjusted Net Profits}}{\text{Net Capital Employed}} \times 100$$

$$= \frac{17,687.50}{93,750} \times 100 = 18.87\%$$

Note : Capital Employed can also be found as average capital employed by deducting half of the profit earned for the year from the capital employed).

Problem 2.51. From the following particulars prepare the Balance sheet of Sri. Mohan Ram ;

Current Ratio	2
Working Capital	Rs. 4,00,000
Capital Block to Current Assets	3 : 2
Fixed Assets to Turnover	1 : 3
Sales Cash/Credit	1 : 2
Creditros Velocity	2 months
Stock velocity	2 months
Debtors velocity	3 months
Capital Block :	
Net Profit 10% of Turnover	
Reserves $2^1/_2$% of Turnover	
Debentures/Share Capital	1 : 2
Gross Profit Ratio	25% to Sales

Solution :

$$\text{Current Ratio} = \frac{\text{Current Assets}}{\text{Current Liabilities}} = 2 \text{ or } 2 : 1$$

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$\therefore$ If current liabilities = x, then current assets = 2x

Working Capital = CA – CL

Or, 4,00,000 = 2x – x

Or x (Current Liabilities) = Rs. 4,00,000

and Current Assets = Rs. 4,00,000 × 2 = Rs. 8,00,00

Capital Block to Current Assets = 3 : 2

$$\text{Capital Block} = \text{Current Assets} \times \frac{3}{2}$$

$$= \text{Rs. } 8,00,000 \times \frac{3}{2} = \text{Rs. } 12,00,000$$

Total Liabilities = Capital Block + Current Liabilities

= Rs. 12,00,000 + 4,00,000 = Rs. 16,00,000

$\therefore$ Total Assets = Rs. 16,00,000

Further, Total Assets = Fixed Assets + Current Assets

$\therefore$ 16,00,000 = F. A. + 8,00,000

Or, Fixed Assets = Rs. 8,00,000

Fixed Assets to Turnover = 1 : 3

$\therefore$ Sales = F. A. × 3

= Rs. 8,00,000 × 3 = Rs. 2,40,000

Gross Profit Ratio = 25% to Sales

$$\therefore \text{ Gross Profit} = \frac{25}{100} \times 2,40,000$$

= Rs. 6,00,000

Stock Velocity = 2 months or 6 times

$$\text{Or, } \frac{\text{Cost of Goods Sold}}{\text{Stock}} = 6$$

$$\text{Or, } \frac{24,00,000 - 6,00,000}{\text{Stock}} = 6$$

$$\text{Or, Stock} = \frac{18,00,000}{6} = \text{Rs. } 3,00,000$$

$$\text{Creditors Velocity} = \frac{\text{Credit Purchases}}{\text{Creditors}} = 2 \text{ months or } 6 \text{ times}$$

As opening stock is not given, cost of goods sold has been taken as purchases.

$$\text{Creditors} = \frac{18,00,000}{6} = \text{Rs. } 3,00,000$$

$$\text{Debtors Velocity} = \frac{\text{Credit Sales}}{\text{Debtors}} = 3 \text{ months or } 4 \text{ times}$$

As cash/Credit Sales = 1 : 2

$$\text{Credit Sales} = 24,00,000 \times \frac{2}{3} = \text{Rs. } 16,00,000$$

$$\text{Debtors} = 16,00,000 \times \frac{1}{4} = \text{Rs. } 4,00,000$$

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$$\text{Net Profit} = 10\% \text{ of Turnover}$$

$$= 24,00,000 \times \frac{10}{100} = \text{Rs. } 2,40,000$$

$$\text{Reserves} = 2\frac{1}{2}\% \text{ of Turnover}$$

$$= 24,00,000 \times \frac{5}{200} = \text{Rs. } 60,000$$

Capital Block = Share Capital + Debentures + Net Profit + Reserves

Or, 12,00,000 = Share Capital + Debentures + 2,40,000 + 60,000

Or, Share Capital + Debenture= 12,00,000 – 2,40,000 – 60,000

= Rs. 9,00,000

Debentures/Share Capital = 1 : 2

$$\therefore \text{ Debentures} = 9,00,000 \times \frac{1}{3} = \text{Rs. } 3,00,000$$

$$\text{and, Share Capital} = 9,00,000 \times \frac{2}{3} = \text{Rs. } 6,00,000$$

BALANCE SHEET OF SRI RAM MOHAN AS ON.....

Liabilities		*Rs.*	*Assets*		*Rs.*
Share Capital		6,00,000	Fixed Assets		8,00,000
Reserves		60,000	Current Assets :		
Profit and Loss A/c.		2,40,000	Stock	3,00,000	
Debentures		3,00,000	Debtors	4,00,000	
Current Laibilities :			Cash (others)	1,00,000	8,00,000
Creditors	3,00,000				
Others	1,00,000				
		4,00,000			
		16,00,000			16,00,000

ADDITIONAL PROBLEMS

Problem 2.52. Following items appear in the Balance Sheet of a Company as on 31st December, 1996

Current Assets :	Rs.	
Stock-in-trade	1,00,000	
Bank Balance	50,000	
Sundry Debtors	2,50,000	
Advances	20,000	
		Rs. 4,20,000
Current Liabilities :		
Sundry Creditors	1,75,000	
Advance received against orders	35,000	
		Rs. 2,10,000

(a) Calculate the current ratio.

(b) State whether each of the following transactions would affect the current ratio favourably or otherwise. Each transaction is to be treated independently.

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(i) Paid Rs. 30,000 to a creditor
(ii) Received Rs. 20,000 from a customer
(iii) Paid cheque of Rs. 25,000 for the purchase of machinery.

Solution :

(a) Current Assets = Current Assets : Current Liabilities
= 4,20,000 : 2,10,000
= 2 : 1.

(b) (i) Paid Rs. 30,000 to a creditor

The effect of this transaction is that on the one hand sundry creditors will decrease by Rs. 30,000 and on the other cash will be reduced by the same amount. Or say, current liabilities and current assets both will decrease by Rs. 30,000. The new current ratio will be :

C. R. = 3,90,000 : 1,80,000
= 2.16 : 1

Hence, the current ratio improves from 2 : 1 to 2.16 : 1 (favourable)

(ii) Received Rs. 20,000 from a customer

The effect of the transaction is that debtors are reduced by Rs. 20,000 and cash increased by Rs. 20,000. Thereby, current assets and current liabilities remain the same and hence there is no effect on the current ratio.

(iii) Paid cheque of Rs. 25,000 for purchase of machinery

The effect of the transaction is that bank balance *i.e.* current assets shall decrease by Rs. 25,000 and there is no change in current liabilities. So obviously, the current ratio would be adversely affected.

Now, Current Ratio = 3,95,000 : 2,10,000
= 1.9 : 1.

Problem 2.53. Calculate *(i)* Creditors turnover Ratio and *(i)* Average Payment Period.

	1995	1996
Annual Credit Purchases	6,80,000	7,50,000
Creditors on January 1	80,000	60,000
Creditors on December, 31	60,000	90,000

Take 360 days in a year.

Solution :

	1995	1996
Average Creditors	$\frac{\text{Rs. } 80{,}000 + \text{Rs. } 60{,}000}{2}$	$\frac{60{,}000 + 90{,}000}{2}$
	= Rs. 70,000	Rs. 75,000

(i) Creditors Turnover Ratio = $\frac{\text{Net Annual Credit Purchases}}{\text{Average Trade Creditors}}$

	$= \frac{\text{Rs. } 6{,}80{,}000}{\text{Rs. } 70{,}000}$	$\frac{\text{Rs. } 7{,}50{,}000}{\text{Rs. } 75{,}000}$
	= 9.71 times	10 times

(ii) Average Payment Period = $\frac{\text{No. of working days}}{\text{Creditors Turnover Ratio}}$

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$$= \frac{360}{9.71} \qquad \frac{360}{10}$$

$$= 37 \text{ days} \qquad 36 \text{ days}$$

Alternatively

$$\text{Average Payment Period} = \frac{\text{Average Trade Creditors} \times \text{No. of working days}}{\text{Net Annual Credit Purchases}}$$

$$= \frac{\text{Rs. } 70{,}000 \times 360}{\text{Rs. } 6{,}80{,}000} \qquad \frac{\text{Rs. } 75{,}000 \times 360}{\text{Rs. } 7{,}50{,}000}$$

$$= 37 \text{ days} \qquad 36 \text{ days}$$

Problem. 2.54. Dryson Ltd. provides the following informations :

Cash sales during the year	1,50,000
Credit sales during the year	2,70,000
Returns Inward	20,000
Total Debtors in the beginning	55,000
Total Debtors at the end	45,000
Provision for bad and doubtful debts	5,000

Calculate :

(i) Debtors Turnover Ratio

(ii) Average Collection Period

Take 360 days in a year and all returns are from credit sales.

Solution :

(i) $\text{Debtors Turnover Ratio} = \frac{\text{Net Credit Annual Sales}}{\text{Average Trade Debtors}}$

$\text{Net Credit Annual Sales} = \text{Rs. } 2{,}70{,}000 - \text{Rs } 20{,}000 = \text{R.}2{,}50{,}000$

$\text{Average Trade Debtors} = \frac{\text{Rs. } 55{,}000 + \text{Rs. } 45{,}000}{2} = \text{Rs. } 50{,}000$

$\text{Debtors Turnover Ratio} = \frac{\text{Rs. } 2{,}50{,}000}{\text{Rs. } 50{,}000} = 5 \text{ times}$

(ii) $\text{Average Collection Period} = \frac{\text{Average Trade Debtors} \times \text{No. of days in a year}}{\text{Net Credit Annual Sales}}$

$$= \frac{\text{Rs. } 50{,}000 \times 360}{\text{Rs. } 2{,}50{,}000}$$

$$= 72 \text{ days}$$

Alternatively

$$\text{Average Collection Period} = \frac{\text{No. of days in year}}{\text{Debtors Turnover Ratio}}$$

$$= \frac{360}{5} = 72 \text{ days}$$

Problem 2.55. The following is the revenue statement of a Ltd. company for the year ending 31st December, 1996 :

Sales	6,00,000
Less : Cost of goods sold	4,00,000

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Gross Profit	2,00,000
Less: Operating Expenses	1,20,000
Operating Profit	80,000
Add : Non-operating income	12,000
	92,000
Less : Non-operating expenses	4,000
Net Profit	88,000

Calculate :

(a) Gross Profit Ratio
(b) Operating Ratio
(c) Operating Profit Ratio
(d) Net Profit Ratio

Solution :

(a) Gross Profit Ratio $= \frac{\text{Gross Profit}}{\text{Net Sales}} \times 100$

$= \frac{\text{Rs. 2,00,000}}{\text{Rs. 6,00,000}} \times 100$

$= 33.33\%$

(b) Operating Ratio $= \frac{\text{Cost of goods sold+Operating expenses}}{\text{Net Sales}} \times 100$

$= \frac{\text{Rs. 4,00,000 + Rs. 1,20,000}}{\text{Rs. 6,00,000}} \times 100$

$= \frac{\text{Rs. 5,20,000}}{\text{Rs. 6,00;000}} \times 100$

$= 86.67\%$

(c) Operating Profit Ratio $= \frac{\text{Operating Profit}}{\text{Net Sales}} \times 100$

$= \frac{\text{Rs. 80,000}}{\text{Rs. 6,00,000}} \times 100$

$= 13.33\%$

Alternatively

Operating Profit Ratio $= 100 - \text{Operating Ratio}$

$= 100 - 86.87 = 13.33\%$

(d) Net Profit Ratio $= \frac{\text{Net Profit}}{\text{Net Sales}} \times 100$

$= \frac{\text{Rs. 80,000}}{\text{Rs. 6,00,000}} \times 100$

$= 14.67\%$

Problem 2.56. You are supplied with the following information from the records of M/s. Anand Prabhat Ltd. for the year ending Dec 31, 1996.

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(i)	Trade debtors at the end of the year	Rs. 90,000
(ii)	Trade creditors in the beginning of the year	Rs. 25,000
(iii)	Trade creditors at the end of the year	Rs. 45,000
(iv)	Net working capital	Rs. 1,20,000
(v)	Stock turnover ratio	5.0 times
(vi)	Sales in the year 1996	Rs. 5,00,000
(vii)	Gross Profit	20% on sales

Calculate :

(a) Average Stock
(b) Purchases
(c) Average Payment Period
(d) Average Collection Period
(e) Creditors Turnover Ratio
(f) Working Capital Turnover Ratio.

Solution :

Cost of goods sold = Sales – Gross Profit
= Rs. 5,00,000 – 20% of Rs. 5,00,000
= Rs. 5,00,000 – Rs. 1,00,000
= Rs. 4,00,000

(a) Average Stock

$$\text{Stock Turnover Ratio} = \frac{\text{Cost of goods sold}}{\text{Average Stock}}$$

$$5.0 = \frac{\text{Rs. } 4,00,000}{\text{Average Stock}}$$

$$\text{Average Stock} = \frac{\text{Rs. } 4,00,000}{5.0}$$

$$\text{Average Stock} = \text{Rs. } 80,000$$

(b) Purchases

Cost of Goods Sold = Opening stock + Purchases – Closing Stock
Purchases = Cost of goods sold – Opening Stock + Closing stock
= Rs. 4,00,000 – Rs. 80,000 + Rs. 80,000 = 4,00,000

(In this case there is no difference between opening and closing stock so the figure of purchases and cost of goods sold will be the same.)

(c) Average Payment Period

$$\text{Average Payment Period} = \frac{\text{Average trade creditors} \times \text{No. of working days}}{\text{Net Annual Credit Purchases}}$$

$$\text{Average Trade Creditors} = \frac{\text{Rs. } 25,000 + \text{Rs. } 45,000}{2} = \text{Rs. } 35,000$$

$$\text{Average Payment Period} = \frac{\text{Rs. } 35,000}{\text{Rs. } 4,00,000} \times 365 = 31.9 \text{ or } 32 \text{ days.}$$

(d) Average Collection Period

$$= \frac{\text{Average trade debtors} \times \text{No. of working days}}{\text{Annual Net Credit Sales}}$$

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$$= \frac{\text{Rs. } 90,000 \times 365}{\text{Rs. } 5,00,000}$$

(All sales are taken as credit sales) = 65.7 or 66 days

(e) Creditors Turnover Ratio

$$\text{Creditors Turnover Ratio} = \frac{\text{Annual net credit purchases}}{\text{Average trade creditors}}$$

$$= \frac{\text{Rs. } 4,00,000}{\text{Rs. } 35,000} = 11.4 \text{ times}$$

(f) Working Capital Turnover Ratio

$$\text{Working Capital Turnover Ratio} = \frac{\text{Cost of goods sold}}{\text{Average working capital}}$$

$$= \frac{\text{Rs. } 4,00,000}{\text{Rs. } 1,20,000} = 3.33 \text{ times}$$

Problem 2.57. An engineering Company has the following capital structure :

	Rs.
9% preference shares of Rs. 100 each	10,00,000
Equity shares of Rs. 10 each	40,00,000
	50,00,000

The following information relating to the financial year just ended are :

Profit after tax	Rs. 22,00,000
Equity dividend paid	20%
Market price of equity shares	Rs. 20 each

You are required to state the following :

(i) Dividend yield on equtity shares

(ii) Cover for preference and equity dividend

(iii) Earnings yield ratio.

Solution :

(i) Dividend yield on equity shares

$$= \frac{\text{Dividend per share}}{\text{Market price per share}}$$

$$= \frac{\text{Rs. } 2 \text{ (20\% of Rs. 10)}}{\text{Rs. } 20}$$

= Re. 1 or 10%

(ii) (a) Cover for preference dividend

$$= \frac{\text{Profit after tax}}{\text{Preference dividend}}$$

$$= \frac{\text{Rs. } 22,00,000}{\text{Rs. } 90,000} = 24.44 \text{ times}$$

(b) Cover for equity dividend

$$\frac{\text{Profit after tax and Preference dividend}}{\text{Equity dividend}}$$

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$$= \frac{\text{Rs. } 22,00,000 - \text{Rs. } 90,000}{\text{Rs. } 8,00,000}$$

$$= \frac{\text{Rs. } 21,10,000}{\text{Rs. } 8,00,000} = 2.6 \text{ times}$$

(iii) Earning yield ratio

$$= \frac{\text{Earning per share}}{\text{Market price per share}} \times 100$$

$$\text{Earnings per share} = \frac{\text{Profits available for equity shareholders}}{\text{No. of equity shares}}$$

$$= \frac{\text{Rs. } 21,10,000}{\text{Rs. } 4,00,000} = \text{Rs. } 5.275$$

$$\text{Earnings yield Ratio} = \frac{5.275}{20} \times 100 = 26.375\%$$

Problem 2.58. The following is Balance Sheet of S. Ltd. as on 31st December, 1996 :

Liabilities		*Rs.*	*Assets*	*Rs.*
Equity share Capital		1,50,000	Plant and Machinery	1,00,000
Reserve Fund		40,000	Investments	75,000
6% Debentures		80,000	Stock	40,000
Sundry Creditors		30,000	Sundry Debtors	30,000
Profit and Loss A/c.			Bills Receivables	40,000
Previous year	1,000		Bank Balance	30,000
Current year	24,000		Patents (worthless)	7,500
		25,000	Preliminary Expenss	2,500
		3,25,000		3,25,000

The directors intend to transfer a sum of Rs. 5,000 out of current year's profits to provisions for tax. The investment is related to business activities. You are required to calculate.

(i) Gross Capital Employed
(ii) Net Capital Employed.
(iii) Average Net Capital Employed.
(iv) Return on Net Capital Employed.

Solution :

Computation of Capital Employed

Plant and Machinery	1,00,000
Investments	75,000
Stock	40,000
Sundry Debtors	30,000
Bills Receivables	40,000
Bank Balance	30,000
(i) Gross Capital Employed	3,15,000

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(ii) Net Capital Employed = Gross Capital Employed – Current Liabilities

Gross Capital Employed		Rs. 3,15,000
Less : Sundry Creditors	30,000	
Provision for taxation	5,000	35,000
Net Capital Employed		2,80,000

(iii) Average Net Capital Employed = Net Capital Employed

$$- \frac{1}{2} \text{ of current year's profit}$$

$$= \text{Rs. } 2,80,000 - \text{Rs. } 12,000 = \text{Rs. } 2,68,000$$

(iv) Return on Net Capital Employed = $\frac{\text{Profit}}{\text{Net Capital Employed}}$

Profit = Current year's Profit + Interest on debentures

= Rs. 24,000 + Rs. 4,800 = Rs. 28,800

$$\text{Return on Net Capital Employed} = \frac{\text{Rs. } 28,800}{\text{Rs. } 2,80,000} = \text{Rs. } 10.29\%$$

Notes *(a)* Investment is inside the business so it is takn for capital employed.

(b) Interest on debentures is added back to profit.

Problem 2.59. The summarised Balance Sheets of Sundry Ltd. as on 31st December 1990, 1991 and 1992 are given below :

(Rs. in Lakhs)

Liabilities	*1990*	*1991*	*1992*
Paid-up Capital	200	200	200
Long-term Borrowings :			
(i) From Banks	70	100	130
(ii) From Others	280	350	380
Current Liabilities	50	60	100
Total	600	710	810
Assets			
Gross Block	360	365	370
Less : Depreciation	70	100	120
Net Block	290	265	250
Current Assets	150	200	240
Profit and Loss Account	160	245	320
	600	710	810

From the Balance Sheet, compute the following as at 31st December 1990, 1991 and 1992.

(a) Debt Equity Ratio (Long-term Debt to Shareholders' Funds)

(b) Working Capital

(c) Current Ratio

(d) Fixed Assets Ratio.

Solution :

(a) Debt Equity Ratio

(Ratio of long-term debt to shareholders' funds) = $\frac{\text{Long term Debt}}{\text{Shareholders Funds}}$

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Long-term Debt

	1990	*1991*	*1992*
Borrowing from Banks	70	100	130
Borrowing from others	280	350	380
	350	450	510
Shareholders' Funds			
Paid-up Capital	200	200	200
Less : Profit and Loss Account (Loss)	160	245	320
	40	–45	–120

Debt-Equity Ratio $= \frac{350}{40}$ $\frac{450}{-45}$ $\frac{150}{-120}$

$= 8.75$ Negative (Not covered) Negative (Not Covered)

(b) Current Ratio $= \frac{\text{Current Assets}}{\text{Current Liabilities}}$

$= \frac{150}{50}$ $\frac{200}{60}$ $\frac{240}{100}$

$= 3.0$ 3.3. 2.4

(c) *Working Capital*

Current Assets	150	200	240
Less : Current Liabilities	50	60	100
	100	140	140

(d) *Fixed Assets Ratio* $= \frac{\text{Fixed assets}}{\text{Total Long–term Funds}}$

$= \frac{\text{Fixed Assets}}{\text{Long–term Borrowings + Shareholders' Funds}}$

	1990	1991	1992
$=$	$\frac{290}{350 + 40}$	$\frac{265}{450 - 45}$	$\frac{250}{510 - 120}$
$=$	$\frac{290}{390}$	$\frac{265}{405}$	$\frac{250}{390}$
$=$	0.74	0.65	0.64

Problem 2.60. From the following details, make out the Balance Sheet with as many details as possible :

(i)	Stock Velocity	= 6
(ii)	Capital Turnover Ratio	= 2
(iii)	Fixed Assets Turnover	= 4
(iv)	Gross Profit Turnover Ratio	= 20%
(v)	Debtors Velocity	= 2 months
(vi)	Creditors Velocity	= 73 days

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The gross profit was Rs. 60,000. Reserve and Suplus amounts to 20,000. Closing stock was Rs. 5,000 in excess of opening stock.

Solution :

Calculation of Sales

$$\text{Gross Profit Ratio} = \frac{\text{Gross Profit}}{\text{Sales}} \times 100$$

Since G/P ratio is 20% and Gross Profit is 60,000, Sales are :

$$\frac{20}{100} = \frac{60,000}{\text{Sales}}$$

or $\quad 20 \text{ Sales} = 60,000 \times 100$

or $\quad \text{Sales} = 60,000 \times \frac{100}{20} = \text{Rs. } 3,00,000$

Calculation of Purchases

Purchases =Cost of Goods Sold + Closing Stock – Opening Stock

As G/P ratio is 20% so cost of goods is 100 – 20 or say 80%

$$\therefore \quad \text{Cost of goods sold} = 3,00,000 \times \frac{80}{100} = \text{Rs. } 2,40,000$$

$$\text{Purchases} = 2,40,000 + 5,000$$

(As Closing Stock is Rs. 5,000 more than Opening Stock)

$$= \text{Rs. } 2,45,000$$

Calculation of Stock

$$\text{Stock–turnover ratio} = \frac{\text{Cost of Goods Sold}}{\text{Average Stock}}$$

$$6 = \frac{2,40,000}{\text{Average Stock}}$$

or $\quad 6 \times \text{Average Stock} = 2,40,000$

or $\quad \text{Average Stock} = \text{Rs. } 40,000$

$$\text{Average Stock} = \frac{\text{Op. Stock} + \text{Cl. Stock}}{2}$$

$$40,000 = \frac{\text{Op. Stock} + (\text{Op. Stock} + 5,000)}{2}$$

(Since closing stock is Rs. 5,000 more)

$$80,000 - 5,000 = 2 \text{ Op. Stock}$$

or $\quad \text{Opening Stock} = \frac{75,000}{2} = \text{Rs. } 37,500$

$$\text{Closing Stock} = \text{Op. Stock} + 5,000$$

$$= 37,500 + 5,000$$

$$= \text{Rs. } 42,500$$

Calcultion of Debtors

$$\text{Debtors Velocity} = \frac{\text{Total Debtors}}{\text{Credit Sales}} \times \text{No. of months}$$

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or $$\text{Debtors Velocity} = \frac{\text{Total Debtors}}{3,00,000} \times 12 \text{ (Calculated in months)}$$

All Sales have been taken as Credit Sales.

or $$\text{Total Debtors} \times 12 = 3,00,000 \times 2$$

$$\text{Total Debtors} = \frac{3,00,000 \times 2}{12} = \text{Rs. } 50,000$$

Calculation of Creditors

$$\text{Creditors Velocity} = \frac{\text{Total Creditors}}{\text{Credit Purchases}} \times \text{No. of working days}$$

$$73 = \frac{\text{Total Creditors}}{2,45,000} \times 365$$

or $$365 \times \text{Total Creditors} = 2,45,000 \times 73$$

$$\text{Total Creditors} = \frac{2,45,000 \times 73}{365} = \text{Rs. } 49,000$$

Calculation of Fixed Assets

$$\text{Fixed Assets Turnover Ratio} = \frac{\text{Cost of Goods Sold}}{\text{Fixed Assets}}$$

or $$4 \times \text{Fixed Assets} = 2,40,000$$

$$\text{Fixed Assets} = \frac{2,40,000}{4} = \text{Rs. } 60,000$$

Calculation of Capital

$$\text{Capital Turnover Ratio} = \frac{\text{Cost of Goods Sold}}{\text{Capital}}$$

$$2 = \frac{2,40,000}{\text{Capital}}$$

or $$2 \times \text{Capital} = 2,40,000$$

$$\text{Capital} = \text{Rs. } 1,20,000$$

Alternatively

In case capital is taken to mean net worth, then net worth = Rs. 1,20,000

or Share Capital + Reserve & Surplus = Rs. 1,20,000

or Share Capital = 1,20,000 – 20,000 = Rs. 1,00,000

BALANCE SHEET

Liabilities	*Rs.*	*Assets*	*Rs.*
Capital	1,00,000	Fixed Assets	60,000
Reserves & Surplus	20,000	Stock	42,500
Creditors	49,000	Debtors	50,000
		Cash (balancing figure)	16,500
	1,69,000		1,69,000

Problem 2.61. The following information is given below :

Current ratio : 2.5 ; Fixed assets turnover ratio : 2 times

Liquidity ratio : 1.5 ; Average debt collection period : 2 months

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Net working Capital Rs. 3,00,000
Stock turnover ratio : 6 times ; Fixed assets : Shareholders Net worth 1 : 1
(Cost of sales/closing stock) ;
Gross profit ratio : 20% ; Reserves : Share Capital 0.5 : 1
Draw up a Balance Sheet from the above information.

Solution :

1. Current Liabilities and Current Assets :

Net Working Capital = Current Assets – Current Liabilities
Current Ratio = 2.5

Let current liabilities be x so, current assets will be 2.5 x.

Net Working Capital = 2.5 x – x
Rs. 3,00,000 = 2.5 x – x
Rs. 3,00,000 = 1.5x

$$x = \frac{\text{Rs. } 3,00,000}{1.5} = \text{Rs. } 2,00,000$$

When current liabilities are Rs. 2,00,000, Current assets will be

2,00,000 × 2.5 = Rs. 5,00,000
Liquid Assets = 2,00,000 × 1.5 = Rs. 3,00,000

2. Stock :

Stock = Current Assets – Liquid Assets
Stock = Rs. 5,00,000 – Rs. 3,00,000 = Rs. 2,00,000

3. Cost of Sales :

$$\text{Stock Turnover Ratio} = \frac{\text{Cost of Sales}}{\text{Stock}}$$

$$6 = \frac{\text{Cost of Sales}}{\text{Rs. } 2,00,000}$$

Cost of sales = Rs. 2,00,000 × 6 = Rs. 12,00,000

4. Sales :

Cost of Sales + Gross Profit

$$\text{Gross Profit} = \frac{\text{Rs. } 12,00,000 \times 20}{80} = \text{Rs. } 3,00,000$$

Sales = Rs. 12,00,000 + Rs. 3,00,000 = Rs. 15,00,000

5. Fixed Assets :

$$\text{Fixed Assets Turnover Ratio} = \frac{\text{Sales}}{\text{Fixed Assets}}$$

$$2 = \frac{\text{Rs. } 15,00,000}{\text{Fixed Assets}}$$

$$\text{Fixed Assets} = \frac{\text{Rs. } 15,00,000}{2} = \text{Rs. } 7,50,000$$

6. Debtors :

$$\text{Average Debt Collection Period} = \frac{\text{Total Debtors} \times \text{No. of months}}{\text{Sales}}$$

$$2 = \frac{\text{Total Debtors} \times 12}{15,00,000}$$

$$\text{Total Debtors} = \frac{\text{Rs. } 15,00,000 \times 2}{12} = \text{Rs. } 2,50,000$$

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7. Shareholders' Net Worth :

Fixed Assets : Shareholders' Net Worth
1 : 1
Rs. 7,50,000 : Rs. 7,50,000

8. Share Capital

Reserve : Share Capital = 0.5 : 1

Shareholders' Net Worth = Share Capital + Reserve

Rs. 7,50,000 = 1 + 0.5

$$\text{Share Capital} = \frac{\text{Rs. } 7,50,000 \times 1}{1.5} = \text{Rs. } 5,00,000$$

Reserves = Rs. 7,50,000 – Rs. 5,00,000 = Rs. 2,50,000

9. Long-term Debts :

Long-term Debts = Total Assets – (Shareholders' net worth + Current Liabilities)

= Rs. 12,50,000 – (Rs. 7,50,000 + Rs. 2,00,000)

Long-term Debts = Rs. 3,00,000.

Note. Sales have ben used for fixed assets turnover ratio, cost of sales could also be used.

BALANCE SHEET

Liabilities	*Rs.*	*Assets*	*Rs.*
Share Capital	5,00,000	Fixed Assets	7,50,000
Reserves	2,50,000	Liquid Assets	3,00,000
Long-term Debts	3,00,000	Stock	2,00,000
Current Liabilities	2,00,000		
	12,50,000		12,50,000

Problem 2.62. With the following ratios and further information given below complete the Trading Account, Profit and Loss Account and Balance Sheet of Mr. X :

Gross Profit Ratio = 25%

Net Profit Ratio = 20%

Sales/Inventory Ratio = 8

$$\text{Fixed Assets/Total Current Assets} = \frac{3}{4}$$

$$\text{Fixed Assets/Total Capital} = \frac{3}{2}$$

$$\text{Capital/Total Outside Liabilities} = \frac{2}{5}$$

Fixed Assets = Rs. 15,00,000

Closing Stock = Rs. 2,00,000

PROFORMA TRADING AND PROFIT & LOSS ACCOUNT

	Rs.		*Rs.*
To Cost of Sales	.....	By Sales	.....
To Gross Profit (25% on Sales)	.....		.....

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To Expenses	.....	By Gross Profit	.....
To Net Profit (20% on Sales)	.....		
	.....		.....

PROFORMA BALANCE SHEET

Liabilities	*Rs.*	*Assets*	*Rs.*
Capital		Fixed Assets	.....
Balance	.....	*Current Assets*	
Add : Net Profit	.....	Stock	.....
	.....	Other Current Assets	.....
Total Liabilities	.....		
	.....		.....

Solution :

(a) Sales/Inventory = 8 (given)

$$\frac{\text{Sales}}{2,00,000} = 8$$

$$\text{Sales} = 2,00,000 \times 8$$

$$= \text{Rs. } 16,00,000$$

(b) Gross Profit Ratio = 25% (given)

$$\text{Gross Profit} = \frac{25}{100} \times 16,00,000$$

$$= \text{Rs. } 4,00,000$$

$$\text{Cost of Sales} = \text{Sales} - \text{Gross Profit} = 16,00,000 - 4,00,000$$

$$= \text{Rs. } 12,00,000$$

(c) Net Profit Ratio = 20% (given)

$$\text{Net Profit} = \frac{20}{100} \times 16,00,000$$

$$= \text{Rs. } 3,20,000$$

(d) Fixed Assets/Total Current Assets $= \frac{3}{4}$ (given)

$$\frac{15,00,000}{\text{Total Current Assets}} = \frac{3}{4}$$

$$\text{Total Current Assets} = 15,00,000 \times \frac{4}{3}$$

$$= 20,00,000$$

(e) Fixed Assets/Capital $= \frac{3}{2}$ (given)

$$\frac{15,00,000}{\text{Capital}} = \frac{3}{2}$$

$$\text{Or, Capital} = \text{Rs. } 10,00,000$$

(f) Capital/Total Outside Liabilities $= \frac{2}{3}$ (given)

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$$\frac{10,00,000}{\text{Total Outside Liabilities}} = \frac{2}{5}$$

$$\text{Total Outside Liabilities} = 10,00,000 \times \frac{5}{2}$$

$$= \text{Rs. } 25,00,000.$$

TRADING AND PROFIT AND LOSS ACCOUNT

	Rs.		*Rs.*
To Cost of Sales	12,00,000	By Sales	16,00,000
To Gross Profit (25% on Sales)	4,00,000		
	16,00,000		16,00,000
To Expenses (balancing figure)	80,000	By Gross Profit	4,00,000
To Net Profit (20% on sales)	3,20,000		
	4,00,000		4,00,000

BALANCE SHEET

Liabilities	*Rs.*		*Assets*	*Rs.*	*Rs..*
Capital			Fixed Assets		15,00,000
Balance	6,80,000.		Current Assets		
Add : Net Profit	3,20,000		Stock	2,00,000	
		10,00,000	Other Current		
Total outside Liabilities		25,00,000	Assets	18,00,000	20,00,000
		35,00,000			35,00,000

Problem 2.63. A factory, engaged in an industry which is capital intensive, has been in operation for ten years. The capital employed is Rs. 170 lakhs out of which Rs. 100 lakhs represent equity capital and reserves, Rs. 50 lakhs long term borrowings on debentures and Rs. 20 lakhs cash credit from banks. The working capital of the company is Rs. 85 lakhs made up of stocks Rs. 30 lakhs, Stors Rs. 14 lakhs, Debtors Rs. 35 lakhs. Advances, Deposits, etc. Rs. 6 lakhs. Annual sale is Rs. 80 lakhs. Calculate six financial ratios from the above for the use of management.

Solution :

The assets and liabilities position of the company can be presented as follows :

Assets :	Rs. (Lakhs)	Rs. (Lakhs)
Stocks	30	
Stores	14	
Debtors	35	
Advances, Deposits, etc.	6	
	85	85
Fixed Assets (assumed)		85
		170
The assets are financed by :		
Share Capital and Reserves	100	
Long-term borrowing	50	

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Bank Overdraft (Cash Credit)	20	
	170	170

The following ratios can be calculated for the benefit of the management :

Liquidity Ratios :

(i) Current Ratio $= \frac{\text{Current Assets}}{\text{Current Liabilities}}$

$= \frac{\text{Rs. 85 lakh}}{\text{Rs. 20 lakhs}} = 4.25 : 1$

(ii) Liquidity Ratio $= \frac{\text{Liquid Assets}}{\text{Current Liabilities}}$

$= \frac{\text{Rs. 41 lakhs}}{\text{Rs. 20 lakhs}} = 2.05 : 1.$

Solcency Ratios :

(iii) Debt–Equity Ratio $= \frac{\text{Outsiders' Funds}}{\text{Shareholders Funds}}$

$= \frac{\text{Rs. 70 lakhs}}{\text{Rs. 100 lakhs}} = 0.7 : 1$

(iv) Proprietory Ratio $= \frac{\text{Shareholders' Funds}}{\text{Total Assets}}$

$= \frac{\text{Rs. 100 lakhs}}{\text{Rs. 170 lakhs}} = 0.59 : 1$

(v) Fixed Assets to Proprietors' Funds

$= \frac{\text{Rs. 85 lakhs}}{\text{Rs. 100 lakhs}} = 0.85 : 1.$

(vi) Fixed Assets Ratio $= \frac{\text{Fixed Assets}}{\text{Total Long–term Funds}}$

$= \frac{\text{Rs. 85 lakhs}}{\text{Rs. 150 lakhs}} = 0.57 : 1.$

Problem 2.64. Given the following information for ABC Company at the end of 1996, determine balances for the income statement and the balance sheet :

Net sales : Rs 1,00,000
Debtors Turnover Ratio based on net sales : 2
Inventory Turnover Ratio : 1.25
Fixed Assets Turnover Ratio : 0.8
Debt Assets Ratio : 0.6
Net Profit Margin : 5%
Gross Profit Margin 25%
Return on Investment : 2%

ABC COMPANY
INCOME STATEMENT
for the year ending Dec. 31, 1996

Sales	Rs. 1,00,000
Cost of Goods sold	.....
Gross Profit	.....

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Other Expenses	.....
Earning before tax	.....
Taxes @ 50%	.....
Earnings after tax	.....

BALANCE SHEET

(as on 31st Dec, 1996)

Liabilities	*Rs.*	*Assets*	*Rs.*
Equity	.....	Net Fixed Assets	.....
Long-term debt	.....	Inventory	.....
Short-term debt	50,000	Debtors	.....
		Cash	.....
Total	.....	Total	.....

Solution :

Calculations for Income Statement

(i) $\text{Gross Profit Ratio} = \dfrac{\text{G. P.}}{\text{Sales}} \times 100$

$$25\% = \frac{\text{G. P.}}{\text{Rs. 1,00,000}}$$

$$\text{Gross Profit} = \text{Rs. 25,000}$$

(ii) Cost of Goods Sold = Sales – Gross Profit

= Rs. 1,00,000 – Rs. 25,000

= Rs. 75,000

(iii) $\text{Net Profit} = \dfrac{\text{Rs. 1,00,000} \times 5}{100} = \text{Rs. 5,000}$

(iv) Net Profit before tax = Net Profit + Tax

Rate of tax = 50%

Net Profit before tax = Rs. 5,000 + (Rs. 5,000 tax) = Rs. 10,000

(100% amount will be added to N.P. after tax)

(v) Expenses = Gross Profit – Net Profit before tax

= Rs. 25,000 – Rs. 10,000 = Rs. 15,000

Calculations for Balance Sheet

(i) $\text{Debtors Turnover Ratio} = \dfrac{\text{Net Sales}}{\text{Debtors}}$

$$2 = \frac{\text{Rs. 1,00,000}}{\text{Debtors}}$$

$$\text{Debtors} = \frac{\text{Rs. 1,00,000}}{2} = \text{Rs. 50,000}$$

(ii) $\text{Inventory Turnover Ratio} = \dfrac{\text{Cost of Goods Sold}}{\text{Inventory}}$

$$1.25 = \frac{\text{Rs. 75,000}}{\text{Inventory}}$$

$$\text{Inventory} = \frac{\text{Rs. 75,000}}{1.25} = \text{Rs. 60,000}$$

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(iii) Fixed Assets Turnover Ratio $= \dfrac{\text{Sales}}{\text{Fixed Assets}}$

$0.8 = \dfrac{\text{Rs. } 1,00,000}{\text{Fixed Assets}}$

$\text{Fixed Assets} = \dfrac{\text{Rs. } 1,00,000}{0.8} = \text{Rs. } 1,25,000$

(iv) Return on Investment $= \dfrac{\text{Earnings After Tax}}{\text{Total Assets}}$

$2\% = \dfrac{\text{Rs. } 5,000}{\text{Total Assets}}$

$\text{Total Assets} = \dfrac{5,000 \times 100}{2}$

$= \text{Rs. } 2,50,000$

(v) Debt–Assets Ratio $= \dfrac{\text{Total Debt}}{\text{Total Assets}}$

$0.6 = \dfrac{\text{Total Debt}}{\text{Rs. } 2,50,000}$

$\text{Total Debt} = \text{Rs. } 2,50,000 \times 0.6$

$= \text{Rs. } 1,50,000$

(vi) Long-term Debt = Total Debt – Short-term debt

= Rs. 1,50,000 – Rs. 50,000 = Rs. 1,00,000

(vii) Equity = Total Assets – Total Debt

= Rs. 2,50,000 – Rs. 1,50,000 = Rs. 1,00,000

ABC COMPANY

INCOME STATEMENT

(for the year ending 31st Dec. 1996)

	Rs.
Sales	1,00,000
Cost of Goods Sold	75,000
Gross Profit	25,000
Expenses	15,000
Earnings Before Tax	10,000
Tax @ 50%	5,000
Earnings After tax	5,000

BALANCE SHEET

(as on 31st Dec, 1996)

Liabilities	*Rs.*	*Assets*	*Rs.*
Equity	1,00,000	Net Fixed Assets	1,25,000
Long-term debt	1,00,000	Inventory	60,000
Short-term debt	50,000	Debtors	50,000
		Cash (Balancing figure)	15,000
	2,50,000		2,50,000

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3

Statement of Changes in Financial Position–1

(Funds Flow Statement)

Problem 3.1 Find out the changes in the working capital from the Balance Sheet data given below :

	Dec. 31, 1993 Rs.	*Dec. 31 1994* Rs.
Capital & Liabilities		
Share Capital	3,00,000	3,75,000
Trade Creditors	1,06,000	70,000
Profit and Loss A/c	14,000	31,000
	4,20,000	4,76,000
Assets		
Machinery	70,000	1,00,000
Stock in-trade	1,21,000	1,36,000
Debtors	1,81,000	1,70,000
Cash	48,000	70,000
	4,20,000	4,76,000

Solution :

SCHEDULE OF CHANGES IN WORKING CAPITAL

	1993	*1994*	*Increase in Working Capital*	*Decrease in Working Capital*
	Rs.	*Rs.*	*Rs.*	*Rs.*
Current Assets :				
Cash	48,000	70,000	22,000	—
Debtors	1,81,000	1,70,000	—	11,000
Stock-in-trade	1,21,000	136,000	15,000	
	3,50,000	3,76,000		
Current Liabilities :				
Trade Creditors	1,06,000	70,000	36,000	
	1,06,000	70,000		
Working Capital (CA–CL)	2,44,000	3,06,000		
Net Increase in W.C.	62,000			62,000
	3,06,000	3,06,000	73,000	73,000

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Problem 3.2 From the following Balance Sheet of Bharat Company prepare a statement showing changes in Working Capital.

	31. Dec. 1997 Rs.	*31st Dec. 1996* Rs.
Assets :		
Goodwill	5,000	10,000
Cash	70,000	25,000
Debtors	90,000	98,000
Closing Stock	1,20,000	87,000
Long-term Investments	10,000	15,000
Land	27,000	15,000
Preliminary Expenses	3,000	5,000
	3,25,000	2,55,000
Liabilities :		
Trade Creditors	45,000	50,000
Bills Payable	35,000	20,000
Loans (Payable during 1998)	20,000	—
Share Capital	1,50,000	1,25,000
Profit and Loss Account	75,000	60,000
	3,25,000	2,55,000

Solution :

STATEMENT SHOWING CHANGES IN WORKING CAPITAL

Particulars	*1996*	*1997*	*Effect on Working Capital* Increase	Decrease
	Rs.	Rs.	Rs.	Rs.
Current Assets :				
Cash	25,000	70,000	45,000	
Debtors	98,000	90,000		8,000
Closing Stock	87,000	1,20,000	33,000	
	2,10,000	2,80,000		
Current Liabilities				
Trade Creditors	50,000	45,000	5,000	
Bills Payable	20,000	35,000		15,000
Loans (Payable during 1998)	—	20,000		20,000
	70,000	1,00,000		
Working Capital (CA–CL)	1,40,000	1,80,000		
Net increase in Working Capital	40,000			40,000
	1,80,000	1,80,000	83,000	83,000

Note. Loans (payable during 1998) is a current liability.

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Problem 3.3 Calculate funds from operations from the following Profit and Loss Account of M/s R. Kumar & Co.

Profit & Loss Account

	Rs.		*Rs.*
To Salaries	10,000	By Gross Profit	2,00,000
To Rent	3,000	By Profit on sale of Machine	5,000
To Commission	2,000	By Refund of tax	3,000
To Discount allowed	1,000	By Dividends received	2,000
To Provision for Depreciation	14,000		
To Transfers to General Reserves	20,000		
To Provision for tax	10,000		
To Loss on Sale of Investments	5,000		
To Discount on Issue of Debentures	2,000		
To Preliminary Expenses	3,000		
To Selling Expenses	20,000		
To Net Profit	1,20,000		
	2,10,000		2,10,000

Solution :

CALCULATION OF FOUNDS FROM OPERATIONS

		Rs.	*Rs.*
	Net Profit (as given)		1,20,000
Add :	Non-fund or non-operating items which have been debited to Profit and Loss Account :		
	Provision for Depreciation	14,000	
	Transfers to General Reserves	20,000	
	Provision for tax	10,000	
	Loss on Sale of Investments	5,000	
	Discount on Issue of Debentures	2,000	
	Preliminary Expenses	3,000	54,000
			1,74,000
Less :	Non-fund or non-operating items which have been credited to P/L A/c :		
	Profit on sale of niachine	5,000	
	Refund of tax	3,000	
	Dividends Received	2,000	10,000
	Funds from Operations		1,64,000

Alternatively

ADJUSTED PROFIT AND LOSS ACCOUNT

	Rs.		*Rs.*
To Provision for Depreciation	14,000	By Opening balance	—
To Transfers to General Reserves	20,000	By Profit on Sale of machine	5,000
To Provision for tax	10,000	By Refund of tax	3,000
To Loss on Sale of Investments	5,000	By Dividends Received	2,000
To Discount on Issue of Debentures	2,000	By Funds from Operations	
To Preliminary Expenses	3,000	(balancing figure)	1,64,000
To Closing balance	1,20,000		
	1,74,000		1,74,000

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Problem 3.4 Extracts from the Balance Sheet :

	31 Dec. 1996	*31st Dec. 1997*
	Rs.	*Rs.*
Balance of Profit and Loss A/c	1,00,000	1,50,000
Additional Information :		*Rs.*
(i) Depreciation charged on assets		10,000
(ii) Preliminary expenses written off		5,000
(iii) Amount transferred to Dividend Equalisation Fund		15,000
(iv) A plant having a book value of Rs. 60,000 was sold for		65,000
(v) Interim dividend paid Rs. 10,000		

Calculate funds from operations.

Solution :

CALCULATION OF FOUNDS FROM OPERATIONS

			Rs.
	Closing Balance of Profit and Loss Account (1997)		1,50,000
Add :	Non-fund and non-operating items which have been debited to P/L A/c :	*Rs.*	
	Depreciation charged on assets	10,000	
	Preliminary expenses written off	5,00	
	Amount transfered to Dividend Equalisation Fund	15,000	
	Interim Dividend paid	10,000	40,000
			1,90,000
Less :	Opening Balance of P/L A/c (1996)	1,00,000	
	Non-fund and non-operating items which have been credited to P/L A/c :		
	Profit on sale of Plant (65,000 – 60,000)	5,000	1,05,000
	Funds from operations		85,000

Alternatively

ADJUSTED PROFIT AND LOSS A/C

	Rs.		*Rs.*
To Depreciation	10,000	By Opening balance	1,00,000
To Preliminary Expenses	5,000	By Profit on Sale of Plant	5,000
To Dividend F ualisation Fund	15,000	By Funds from Operations	
To Interim Dividend	10,000	(balancing figure)	85,000
To Closing Balance	1,50,000		
	1,90,000		1,90,000

Problem 3.5 From the following Balance Sheets and the additional information given, you are required to calculate funds from operations for the year ended 31st March, 1997.

Liabilities	*31st March 1997*	*31st March 1996*	*Assets*	*31st March 1997*	*31st March 1996*
	Rs.	*Rs.*			*Rs.*
Share Capital	1,30,000	1,00,000	Fixed Assets	1,46,000	89,500
Retained Earnings	34,000	29,500	*Less :* Depreciation		
Mortgages	30,000	20,000	Goodwill	—	10,000

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Trade Creditors	58,000	62,000	Investments		
Short-tern liabilities	27,000	35,000	(Marketable)	—	10,000
Accrued Expenses	19,000	13,000	Closing Stock	80,000	70,000
			Debtors	54,000	50,000
			Cash	18,000	30,000
	2,98,000	2,59,500		2,98,000	2,59,500

Additional Information :

1. Depreciation provided during the year amounted to Rs. 13,500.
2. Dividends paid in 1996-97 amounted to Rs. 7,000.
3. Goodwill was written off during the year out of retained earnings.

Solution :

CALCULATION OF FOUNDS FROM OPERATIONS

		Rs.	Rs.
	Closing balance of Retained Earnings in the B/S		34,000
Add :	Non-fund and non-operating items which have been debited to retained earnings :		
		Rs.	
	Depreciation	13,500	
	Dividend paid	7,000	
	Goodwill written off	10,000	30,500
			64,500
Less :	Opening balance of retained earnings		29,500
	Funds from operations		35,000

Alternatively

ADJUSTED PROFIT AND LOSS ACCOUNT

	Rs.		*Rs.*
To Depreciation	13,500	By Opening balance	29,500
To Dividend	7,000	By Funds from Operations	35,000
To Goodwill	10,000	(balancing figure)	
To Closing Balance	34,000		
	64,500		64,500

Problem 3.6 Extracts from Balance Sheet

	1995	1996
	Rs.	*Rs.*
Building	1,00,000	1,50,000
Provision for Depreciation	25,000	30,000
Profit and Loss Account	40,000	80,000

Additional Information :

(i) An additional building costing Rs. 1,00,000 was purchased during the year.

(ii) A part of building costing Rs. 50,000 was sold for Rs. 60,000 ; depreciation provided on it was Rs. 10,000.

Find out sources/applications of funds.

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Solution :

PROVISION FOR DEPRECIATION A/C

	Rs.		Rs.
To Building A/c	10,000	By Balance b/d	25,000
To Balance c/d	30,000	By Adjusted P/L A/c (balancing figure)	15,000
	40,000		40,000

BUILDING A/C

	Rs.		Rs.
To Balance b/d	1,00,000	By Cash (Sales)	60,000
To Cash-purchases	1,00,000	By Provision for depreciation	10,000
To Adjusted P/L A/c (Profit on Sale)	20,000	By Balance c/d	1,50,000
	2,20,000		2,20,000

ADJUSTED PROFIT AND LOSS A/C

	Rs.		Rs.
To Provision for Depreciation A/c	15,000	By Balance b/d	40,000
		By Building A/c (Profit on Sale)	20,000
To Balance c/d	80,000	By Funds from operations (balancing figure)	35,000
	95,000		95,000

(i) Purchase of Building for Rs. 1,00,000 is an application of funds.
(ii) Sale of Building for Rs. 60,000 is a source of funds.
(iii) Funds from operations of Rs. 35,000 is a source of funds.

Problem 3.7 Extracts from Balance Sheets

	As on 30-6-1996	*As on 30-6-1997*
	Rs.	*Rs.*
Equity Share Capital	2,00,000	3,00,000
Share Premium A/c	20,000	30,000
9% Debentures	1,00,000	1,50,000

Additional Information :
9% Debentures worth Rs. 30,000 were redeemed during the year.
Prepare necessary accounts to find out sources/applications of funds.

Solution :

EQUITY SHARE CAPITAL A/C

	Rs.		Rs.
To Balance c/d	3,00,000	By Balance b/d	2,00,000
		By Cash-Issue (balancing figure)	1,00,000
	3,00,000		3,00,000

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SHARE PREMIUM A/C

	Rs.		Rs.
To Balance c/d	30,000	By Balance b/d	20,000
		By Cash-on issue of shares (balancing figure)	10,000
	30,000		30,000

9% DEBENTURES A/C

	Rs.		Rs.
To Cash-Redemption	30,000	By balance b/d	1,00,000
To balance c/d	1,50,000	By Cash-issue (balancing figure)	80,000
	1,80,000		1,80,000

(i) Issue of equity shares for Rs. 1,00,000 is a source of funds.
(ii) Share Premium of Rs. 10,000 is a source of funds.
(iii) Redemption of Debentures Rs. 30,000 is an application of funds.
(iv) Issue of Debentures Rs. 80,000 is a source of funds.

Problem 3.8 Extracts of Balance Sheet :

	1996	1997
	Rs.	Rs.
Trade Investments	50,000	70,000

Additional Information :

(i) Rs. 5,000 by way of dividend has been received during the year including Rs. 2,000 from pre-acquisition profits which have been credited to Investments A/c.

(ii) Investments costing Rs. 10,000 have been sold during the year for Rs. 10,000.

Find out sources/applications of funds.

Solution :

TRADE INVESTMENTS ACCOUNT

	Rs.		Rs.
To balance b/d	50,000	By Dividend (Pre-acquisition)	2,000
To Cash-purchases (balancing figure)	32,000	By Cash-sale	10,000
		By balance c/d	70,000
	82,000		82,000

(i) Dividend Rs. 5000 received on trade investments is a source of funds.

(ii) Rs. 10,000 realised from sale of trade investments is a source of funds.

(iii) Investments purchased during the year for Rs. 32,000 is an application of funds.

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Problem 3.9 Extrract from the Balance Sheets :

	30-6-96	30-697
	Rs.	*Rs.*
Provision for Taxation (Non-current)	50,000	75,000
Profit and Loss A/c (Cr.)	2,00,000	3,00,000

Additional Information :

Tax paid during the year is Rs. 30,000.

Find out sources and applications of funds.

Solution :

PROVISION FOR TAXATION A/C

	Rs.		*Rs.*
To Cash (tax paid)	30,000	By balance b/d	50,000
To balance c/d	75,000	By Adjusted P/L A/c (balancing figure)	55,000
	1,05,000		1,05,000

ADJUSTED PROFIT AND LOSS A/C

	Rs.		*Rs.*
To Provision for Tax	55,000	By Opening Balance	2,00,000
To Closing Balance	3,00,000	By Funds from operations (balancing figure)	1,55,000
	3,55,000		3,55,000

(i) Tax paid Rs. 30,000 is an application of funds.

(ii) Funds from operations of Rs. 1,55,000 is a source of funds.

Problem 3.10. Extracts from Balance Sheets :

	1996	1997
	Rs.	*Rs.*
Proposed Dividend	80,000	1,00,000
Retained Earnings	3,00,000	4,00,000

Additional Information :

Dividend proposed during the year and debited to Retained Earnings A/c is Rs. 1,00,000.

Prepare Proposed Dividend A/c and Adjusted Profit and Loss A/c to find out sources and applications of funds.

Solution :

PROPOSED DIVIDEND A/C

	Rs.		*Rs.*
To Cash-dividend paid (balancing figure)	80,000	By Balance b/d	80,000
To balance c/d	1,00,000	By Adjusted P/L A/c (Charged during the year)	1,00,000
	1,80,000		1,80,000

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ADJUSTED P/L A/C

	Rs.		Rs.
To Proposed Dividend A/c	1,00,000	By Opening Balance	3,00,000
To Closing Balance	4,00,000	By Funds from operations (balancing figure)	2,00,000
	5,00,000		5,00,000

(i) Dividend paid during the year Rs. 80,000 is an application of funds.

(ii) Funds from operations of Rs. 2,00,000 is a source of funds.

Problem 3.11 From the following Balance Sheets of X Co. Ltd. you are required to prepare a schedule of changes in working capital and statement of flow of funds.

	Dec. 31, 1993	*Dec. 31. 1994*
Assets	*Rs.*	*Rs.*
Land & Building	50,000	50,000
Plant	24,000	34,000
Stock	9,000	7,000
Debtors	16,500	19,500
Cash at Bank	4,000	9,000
Capital and Liabilities		
Capital	80,000	85,000
Profit and Loss Appropriation A/c	14,500	24,500
Creditors	9,000	5,000
Mortgage	—	5,000

Solution :

SCHEDULE OF CHANGES IN WORKING CAPITAL

	1993	*1994*	*Increase in Working Capital*	*Decrease in Working Capital*
Current Assets	*Rs.*	*Rs.*	*Rs.*	*Rs.*
Cash at bank	4,000	9,000	5,000	—
Debtors	16,500	19,500	3,000	—
Stock	9,000	7,000	—	2,000
	29,500	35,500		
Current Liabilities :				
Creditors	9,000	5,000	4,000	—
	9,000	5,000		
Working Capital (CA–CL)	20,500	30,500		
Net Increase in W.C.	10,000			10,000
	30,500	30,500	12,000	12,000

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FUNDS FLOW STATEMENT

Sources	*Rs.*	*Applications*	*Rs.*
Issue of Capital (85,000–80,000)	5,000	Purchase of Plant (34,000 – 24,000)	10,000
Mortgage	5,000	Net Increase in Working Capital	10,000
Funds from operations (24,500–14,500)	10,000		
	20,000		20,000

Problem 3.12. Prepare a funds flow statement from the following Balance Sheets of Indian XL Ltd.

(Rs. in Lakhs)

Liabilities	*1996*	*1995*	*Assets*	*1996*	*1995*
	Rs.	*Rs.*		*Rs.*	*Rs.*
Share Capital	545	545	Fixed Assets	4,933	3,994
Reserves	2,459	1,660	*Less :* Depreciation	1,927	1,651
	3,004	2,205		3,006	2,343
Loan Funds	2,796	2,295			
	5,800	4,500	Investments	62	62
Current Liabilities	1,241	1,533	(Long-term)		
Provisions	434	327	Inventories	2,075	1,804
			Debtors	1,157	687
			Cash & Bank Balance	512	844
			Loans & Advances	663	620
	7,475	6,360		7,475	6,360

Solution :

SCHEDULE OF CHANGES IN WORKING CAPITAL

(Rs. in Lakhs)

	1995	*1996*	*Increase in Working Capital*	*Decrease in Working Capital*
Current Assets :				
Inventories	1,804	2,075	271	
Debtors	687	1,157	470	
Cash & Bank Balance	844	512		332
Loans and Advances (Assumed to be short-term)	620	663	43	
	3,955	4,407		
Current Liabilities :				
Current Liabilities	1,533	1,241	292	
Provisions (assumed to be Current Liabilities)	327	434		107
	1,860	1,675		
Working Capital (CA–CL)	2,095	2,732		637
Net increase in W.C.	637			
	2,732	2,732	1,076	1,076

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FUNDS FLOW STATEMENT

(Rs. in Lakhs)

Sources	*Amount*	*Applications*	*Amount*
	Rs.		*Rs.*
Raising of Loans	501	Purchase of Fixed Assets	939
Funds from Operations	1,075	Increase in Working Capital	637
	1,576		1,576

Working Notes :

(1) *Calculation of Raising of Loans*

	Rs.
Loan Funds in the beginning of 1996	2,295
Loan funds at the end of 1996	2,796
Loans raised during the year	501

(2) *Calculation of Funds from Operations*

	Rs.
Reserves in the beginning of 1996	1,660
Reserves at the end of 1996	2,459
Profit for the year (2,459–1,660)	799
Add : Depreciation (1,927 – 1,651)	276
	1,075

Or

RESERVES A/C

	Rs.		*Rs.*
To Depreciation (1,927 – 1,651)	276	By Balance b/d	1,660
To Balance c/d	2,459	By Funds from Operations (balancing figure)	1,075
	2,735		2,735

Problem 3.13 The following are the summarised balance sheets of Ess Kay Ltd. as on December 1996 and 1997 :

	1996 *Rs.*	1997 *Rs.*
Capital :		
10% Preference share capital	1,00,000	1,10,000
Equity share capital	2,20,000	2,50,000
Share Premium	20,000	26,000
Profit and Loss Account	1,04,000	1,34,000
Liabilities (Non-Current) :		
12% Debentures	70,000	64,000
Current Liabilsities :		
Creditors	38,000	46,000
Bills Payable	5,000	4,000

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Provision for taxation	10,000	12,000
Dividends Payable	7,000	8,000
Total Liabilities and Capital	5,74,000	6,54,000
Non-Current Assets :		
Machinery	2,00,000	2,30,000
Buildings	1,50,000	1,76,000
Land	18,000	18,000
Current Assets :		
Cash	42,000	32,000
Debtors	38,000	38,000
Bills Receivable	42,000	62,000
Stock in hand	84,000	98,000
Total Assets	5,74,000	6,54,000

You are required to prepare a statement of sources and application of funds alongwith a supporting schedule of changes in Working Capital.

Solution :

SCHDULE OF CHANGES IN WORKING CAPITAL

	1996	*1997*	*Increase in W.C.*	*Decrease in W.C.*
Current Assets :	*Rs.*	*Rs.*	*Rs.*	*Rs.*
Cash	42,000	32,000	—	10,000
Debtors	38,000	38,000	—	
Bills Receivable	42,000	62,000	20,000	
Stock in hand	84,000	98,000	14,000	
	2,06,000	2,30,000		
Current Liabilities :				
Creditors	38,000	46,000		8,000
Bills Payable	5,000	4,000	1,000	
Provision for taxation	10,000	12,000	—	2,000
Dividend Payable	7,000	8,000	—	1,000
	60,000	70,000		
Working Capital (C.A. – C.L.)	1,46,000	1,60,000		
Net Increase in Working Capital	14,000			14,000
	1,60,000	1,60,000	35,000	35,000

STATEMENT OF SOURCES AND APPLICATION OF FUNDS

Sources	*Rs.*	*Applications*	*Rs.*
Issue of Preference Share Capital	10,000	Redemption of Debentures	6,000
Issue of Equity Share Capital	30,000	Purchase of Machinery (2,30,000 – 2,00,000)	30,000
Share Premium	6,000		
Funds from Operations	30,000	Addition/Purchase of Building (1,76,000 – 1,50,000)	26,000
		Net Increase in Working Capital	14,000
	76,000		76,000

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Working Notes :

Calculation of Funds from Operations :

	Rs.
Balance of P/L A/c at the end of the year	1,34,000
Less : Balance of P/L A/c in the beginning of the year	1,04,000
Funds from Operations	30,000

Problem 3.14 The following are the Balance Sheets of Pasachim Corporation Ltd., as on 31st December, 1996 and 1997.

BALANCE SHEETS OF PASCHIM CORPORATION LTD.

Liabilities	*1996*	*1997*	*Assets*	*1996*	*1997*
	Rs.	*Rs.*		*Rs.*	*Rs.*
Share Capital :					
(Paid-up)					
11% Cumulative			Land and Buildings	60,000	50,000
Preference Shares	30,000		Plant and Machinery	30,000	50,000
Equity Shares	1,10,000	1,20,000			
General Reserves	4,000	4,000	Sundry Debtors	40,000	48,000
Profit and Loss A/c	2,000	2,400	Stock	60,000	70,000
			Bank	2,400	7,000
9% Debentures	12,000	14,000	Cash	600	1,000
Provision for Taxation	6,000	8,400			
Proposed Dividend	10,000	11,600			
Current Liabilities	49,000	35,600			
	1,93,000	2,26,000		1,93,000	2,26,000

You are required to prepare a schedule of changes in Working capital and a statement of Flow of Funds.

Solution :

SCHEDULE OF CHANGES IN WORKING CAPITAL

	1996	*1997*	*Increase in W.C.*	*Decrease in W.C.*
	Rs.	*Rs.*	*Rs.*	*Rs.*
Current Assets :				
Sundry Debtors	40,000	48,000	8,000	
Stock	60,000	70,000	10,000	
Bank	2,400	7,000	4,600	
Cash	600	1,000	400	
	1,03,000	1,26,000		
Current Liabilities				
Current Liabilities	49,000	35,600	13,400	
	49,000	35,600		
Working Capital (CA–CL)	54,000	90,400		
Net Increase in Working Capital	36,400			36,400
	90,400	90,400	36,400	36,400

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FUNDS FLOW STATEMENT

Soruces	*Rs.*	*Applications*	*Rs.*
Issue of Preference Shares	30,000	Purchase of Plant and Machinery	20,000
Issue of Equity Shares	10,000	Provision for taxation	
Issue of Debentures	2,000	(for 1996, assumed to be paid)	6,000
Issue of land & Buildings	10,000	Proposed Dividend (for 1996,	
Funds from Operations	20,400	assumed to be paid)	10,000
		Net Increase in Working Capital	36,400
	72,400		72,400

Working Notes :

1. As current liabilities are separately given, provision for taxation and proposed dividend have not been taken as Current Liabilities.
2. Calculation of Issue of Preference Shares :

	Rs.
Preference Share Capital in the beginning of 1997	Nil
Preference Share Capital at the end of 1997	30,000
Preference Share Capital raised during the year	30,000

3. Calculation of Issue of Equity Shares :

Equity Share Capital in the beginning of 1997	1,10,000
Equity Share Capital at the end of 1997	1,20,000
Equity Shares issued during the year	10,000

4. *Issue of Debentures :*

	Rs.
9% Debentures in the beginning of 1997	12,000
9% Debentures at the end of 1997	14,000
Debentures Issued during the year	2,000

5. Provision for taxation and proposed dividend for 1996 have been presumed to be paid in 1997.
6. Calculation of Sale of Land and Buildings :

Opening Balance of land and Buildings in 1997	60,000
Closing Balance of Land and Buildings in 1997	50,000
Land & Buildings sold during the year	10,000

7. Purchase of Plant and Machinery :

Opening Balance in 1997	30,000
Closing Balance in 1997	50,000
Purchased during the year	20,000

8. Calculation of funds of funds from Operations :

Closing Balance of P/L Account in 1997	2,400

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Add :	Non-fund and Non-operating items debited to P/L A/c :	
	Provision for taxation	8,400
	Proposed Dividend	11,600
		22,400
Less :	Opening Balance of P/L A/c	2,000
	Fund from Operations	20,400

Alternatively :

ADJUSTED PROFIT AND LOSS ACCOUNT

	Rs.		Rs.
To Provision for taxation	8,400	By Balance b/d	2,000
To Proposed dividend	11,600	By Funds from Operations	
To Balance c/d	2,400	(balancing figure)	20,400
	22,400		22,400

Problem 3.15. From the following Balance Sheets of XYZ Co. Ltd., you are required to prepare fund flow statement (including a schedule of changes in Working Capital) for the year ended 31-12-1991 :

Liabilities	*31-12-90*	*31-12-91*	*Assets*	*31-12-90*	*31-12-91*
	Rs.	Rs.		Rs.	Rs.
Share Capital	70,000	74,000	Cash	9,000	7,800
Debentures	12,000	6,000	Debtors	14,900	17,700
Reserve for Doubtful Debts	700	800	Stock	49,200	42,700
Trade Creditors	10,360	11,840	Land	20,000	30,000
P/L A/c	10,040	10,560	Goodwill	10,000	5,000
	1,03,100	1,03,200		1,03,100	1,03,200

Additional Information :

1. Dividend paid Rs. 3,500.
2. During the year, land was purchased for Rs. 10,000.

Solution :

SCHEDULE OF CHANGES IN WORKING CAPITAL

	1990	1991	*Increase in W.C.*	*Decrease in W.C.*
Current Assets :	Rs.	Rs.	Rs.	Rs.
Cash	9,000	7,800	—	1,200
Debtors	14,900	17,700	2,800	—
Stock	49,200	42,700	—	6,500
	73,100	68,200		
Current Liabilities				
Trade Creditors	10,360	11,840	—	1,480
Reserve for Doubtful Debts	700	800	—	100
	11,060	12,640		
Working Capital (C.A. – C.L.)	62,040	55,560		
Net Decrease in W.C.	—	6,480	6,480	
	62,040	62,040	9,280	9,280

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FUND FLOW STATEMENT

(for the year ended 31.12.1991)

Sources	*Rs.*	*Applications*	*Rs.*
Issue of Share Capital (74,000 – 70,000)	4,000	Redemption of Debentures (12,000 – 6,000)	6,000
Funds from Operations	9,020	Purchase of Land (30,000 – 20,000)	10,000
Net Decrease in W.C.	6,480	Payment of Dividend	3,500
	19,500		19,500

Working Notes :

Funds from Operations :

ADJUSTED PROFIT AND LOSS ACCOUNT

	Rs.		*Rs.*
To Dividend paid	3,500	By Balance b/d	10,040
To Goodwill written off (10,000 – 5,000)	5,000	By Funds from Operations	9,020
To Balance c/d	10,560		
	19,060		19,060

Alternatively :

	Rs.
Funds from Operations :	
Closing balance of P/L A/c (1991)	10,560
Add : Non-fund and non-operating-items which have already been debited to P/L A/c :	
Goodwill written off	5,000
Dividend paid	3,500
	19,060
Less : Opening balance of P/L A/c (1990)	10,040
Funds from Operations	9,020

Problem 3.16. From the following balance sheets of A & Co. Ltd. ; you are required to show any increase or decrease in working capital and sources and applications thereof :

Liabilities	*As at 31.12.92*	*As at 31.12.93*	*Assets*	*As at 31.12.92*	*As at 31.12.93*
	Rs.	*Rs.*		*Rs.*	*Rs.*
Equity Share Capital	2,40,000	3,60,000	Land & Building	1,66,200	3,39,600
Share Premium	24,000	36,000	Machinery	1,06,800	1,53,900
General Reserve	18,000	27,000	Furniture	7,200	14,500
Profit and Loss Account	58,500	62,400	Stock	66,500	78,000
8% Debentures	78,000	78,000	Debtors	1,08,500	1,17,300
Provision for taxation	29,400	32,700	Bank	14,400	10,000
Creditors	1,00,500	1,09,200			
	4,70,400	7,05,300		4,70,400	7,05,300

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Depreciation written off during the year :

	Rs.
On machinery	38,400
On furniture	1,200

Solution :

STATEMENT SHOWING INCREASE OR DECREASE IN WORKING CAPITAL

	1992	1993	*Increase in Working Capital*	*Decrease in Working Capital*
	Rs.	Rs.	Rs.	Rs.
Current Assets :				
Stock	66,300	78,000	11,700	
Debtors	1,09,500	1,17,300	7,800	
Bank	14,400	12,000	—	2,400
	1,90,200	2,07,300		
Current Liabilities :				
Sundry Creditors	1,00,500	1,09,200		(4) 8,700
Provision for taxation	29,400	32,700		3,300
	1,29,900	1,41,900		
Working Capital (CA–CL)	60,300	65,400		
Net Increase in Working Capital	5,100			5,100
	65,400	65,400	19,500	19,500

STATEMENT OF SOURCES AND APPLICATION OF FUNDS

Sources	Rs.	*Applications*	Rs.
Issue of Share Capital	1,20,000	Purchase of Land & Buildings	1,73,400
Share Premium	12,000	Purchase of Machinery	85,500
Issue of Debentures	78,000	Net Increase in W.C.	5,100
Sale of Furniture	1,500		
Funds from Operations	52,500		
	2,64,000		2,64,000

Working :

MACHINERY A/C

	Rs.		Rs.
To balance b/d	1,06,800	By Depreciation	38,400
To Purchases during the year (balancing figure)	85,500	By Balance c/d	1,53,900
	1,92,300		1,92,300

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(2) **LAND & BUILDING A/C**

	Rs.		Rs.
To Balance b/d	1,66,200	By Balance c/d	3,39,600
To Purchases (balancing figure)	1,73,400		
	3,39,600		3,39,600

(3) **FURNITURE A/C**

	Rs.		Rs.
To Balance b/d	7,200	By Depreciation	1,200
		By Cash – Sale (balancing figure)	1,500
		By Balance c/d	4,500
	7,200		7,200

(4) **ADJUSTED PROFIT AND LOSS A/C**

	Rs.		Rs.
To Transfer to Reserves	9,000	By Balance b/d	58,500
To Depreciation on Machinery	38,400	By Funds from Operations	52,500
To Depreciation on Furniture	1,200		
To Balance c/d	62,400		
	1,11,000		1,11,000

Alternative Workings :

Purchase of Machinery :

		Rs.
	Opening balance	1,06,900
Less :	Depreciation	38,400
		68,400
	Closing Balance	1,53,900
	Purchased during the year	85,500

Purchase of Land and Building :

		Rs.
	Opening balance	1,66,200
	Closing balance	3,39,600
	Purchased during the year	1,73,400

Sale of Furniture :

		Rs.
	Opening balance	7,200
Less :	Depreciation	1,200
		6,000
	Closing balance	4,500
	Sold during the year	1,500

Funds from Operations :

	Rs.
Balance of P/L A/c (1993)	62,400

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Add :	Non-fund and non-operating items :	
	Transfer to Reserves	9,000
	Depreciation of machinery	38,400
	Depreciation on furniture	1,200
		1,11,000
Less :	Opening balance of P/L A/c and non-operating incomes :	
	Balance of P/L A/c in the beginning (1992)	58,500
	Funds from Operations	52,500

Problem 3.17. Following are the condensed Balance Sheets of a company :

Liabilities	*1990*	*1991*	*Assets*	*1990*	*1991*
	Rs.	*Rs.*		*Rs.*	*Rs.*
Equity Capital	50,000	53,000	Cash	20,000	25,000
Long-term Debt	14,000	13,000	Accounts Receivable	24,000	27,000
Retained Earnings	28,000	37,000	Inventories	31,000	32,000
Accumulated Depreciation	21,000	25,000	Other Current Assets	8,000	7,000
Sundry Creditors	20,000	21,000	Fixed Assets	50,000	58,000
	1,33,000	1,49,000		1,33,000	1,49,000

Additional Information :

(i) Fixed assets costing Rs. 12,000 were purchased during 1991 for cash.

(ii) Fixed assets (original cost Rs. 4,000, accumulated depreciation Rs. 1,500), were sold at book value.

(iii) Depreciation for the year 1991 amounted to Rs. 5,500 which has been debited to Profit and Loss Account.

(iv) During 1991, dividends paid Rs. 3,000.

You are required to prepare a Statement of Sources and Applications of Funds.

Solution :

STATEMENT OF CHANGES IN WORKING CAPITAL

	1990	*1991*	*Increase in Working Capital*	*Decrease in Working Capital*
	Rs.	*Rs.*	*Rs.*	*Rs.*
Current Assets :				
Cash	20,000	25,000	5,000	—
Accounts Receivable	24,000	27,000	3,000	—
Inventories	31,000	32,000	1,000	—
Other Assets	8,000	7,000	—	1,000
	83,000	91,000		
Current Liabilities :				
Sundry Creditors	20,000	21,000	—	1,000
	20,000	21,000		
Working Capital (C.A.–C.L.)	63,000	70,000		7,000
Net Increase in W.C.	7,000			
	70,000	70,000	9,000	9,000

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STATEMENT OF SOURCES AND APPLICATION OF FUNDS

Sources	*Rs.*	*Applications*	*Rs.*
Issue of Equity Capital (53,000–50,000)	3,000	Repayment of long-term Debt (14,000–13,000)	1,000
Sales of Fixed Assets [1] (4,000–1,500)	2,500	Purchase of Fixed Assets[1]	12,000
Funds from Operations[2]	17,500	Dividends paid	3,000
		Net Increase in W.C.	7,000
	23,000		23,000

Working Notes :

(1) FIXED ASSETS ACCOUNT

	Rs.		*Rs.*
To Balance b/d	50,000	By Cash (sale) (4,000 – 1,500)	2,500
To Cash Purchases (balancing figure)	12,000	By Accumulated Dep. A/c	1,500
		By Balance c/d	58,000
	62,000		62,000

ACCUMULATED DEPRECIATION ACCOUNT

	Rs.		*Rs.*
To Fixed Assets A/c	1,500	By Balance b/d	21,000
To Balance c/d	25,000	By P/L A/c	5,500
	26,500		26,500

(2) *Funds from Operations*

ADJUSTED PROFIT AND LOSS ACCOUNT

	Rs.		*Rs.*
To Depreciation	5,500	By Balance b/d	28,000
To Dividends paid	3,000	By Funds from Operations (balancing figure)	17,500
To Balance c/d	37,000		
	45,500		45,500

Alternatively

	Rs.
Funds from Operations :	
Closing balance of Retained Earnings (1991)	37,000
Add : Non-fund and non-operating items which have already been debited to P/L A/c :	
Depreciation	5,500
Dividends	3,000
	45,500
Less : Opening balance of Retained Earnings (1990)	28,000
Funds from Operations	17,500

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Problem 3.18. From the balance sheet of XYZ Ltd., make out a statement of sources and application of funds and a schedule of changes in working capital.

Assets	*1994*	*1993*	*Liabilities*	*1994*	*1993*
	Rs.	*Rs.*		*Rs.*	*Rs.*
Cash	50,000	40,000	Creditors	1,80,000	1,25,000
Debtors	30,000	15,000	5% Debentures	1,00,000	2,00,000
Stocks	1,00,000	80,000	Equity	2,00,000	1,00,000
Investments (short-term)	1,20,000	50,000	Profit and Loss Account	20,000	—
Fixed Assets	2,00,000	2,00,000			
Profit and Loss Account	—	40,000			
	5,00,000	4,25,000		5,00,000	4,25,000

Provision for depreciation on the last day of 1993 was Rs. 50,000. The same on the last day of 1994 was Rs. 60,000. During the year 1994 a machine costing Rs. 30,000 (depreciation Rs. 10,000) was sold for Rs. 16,000

Solution :

SCHEDULE OF CHANGES IN WORKING CAPITAL

	1993	*1994*	*Increase in W.C.*	*Decrease in W.C.*
	Rs.	*Rs.*	*Rs.*	*Rs.*
Current Assets :				
Cash	40,000	50,000	10,000	—
Debtors	15,000	30,000	15,000	—
Stocks	80,000	1,00,000	20,000	—
Investments	50,000	1,20,000	70,000	—
	1,85,000	3,00,000		
Current Liabilities :				
Creditors	1,25,000	1,80,000		55,000
	1,25,000	1,80,000		
Working Capital (C.A.–C.L.)	60,000	1,20,000		
Net Increase in W.C.	60,000			60,000
	1,20,000	1,20,000	1,15,000	1,15,000

STATEMENT OF SOURCES AND APPLICATION OF FUNDS

Sources	*Rs.*	*Applications*	*Rs*
Issue of Equity (2,00,000–1,00,000)	1,00,000	Redemption of Debentures (2,00,000–1,00,000)	1,00,000
Sale of Machinery	16,000	Purchase of Fixed Assets	40,000
Funds from operations[1]	84,000	Net Increase in W.C.	60,000
	2,00,000		2,00,000

Working Notes :

(1) Calculation of Funds from Operations :

	Rs.
Balance of P/L A/c (1994)	20,000

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Add :	Non-fund/Non-operating items		
	Depreciation	20,000	
	Loss on sale of machine	4,000	
		44,000	
Less :	Opening balance of P/L A/c (1993)	– 40,000	(Loss)
	Funds from Operations	84,000	

(2)	Depreciation charged during the year :	*Rs.*
	Opening balance	50,000
Less :	Depreciation on machine sold	10,000
		40,000
	Closing depreciation	60,000
	Depreciation charged during 1994	20,000

(3)	Loss on sale of Machine :	
	Cost of machine sold	30,000
Less :	Accumulated depreciation	10,000
		20,000
	Sale value	16,000
	Loss on sale	4,000

(4)	Purchase of Fixed Assets :	*Rs.*
	Opening Balance	2,00,000
Less :	Written down value of assets sold (30,000–10,000)	20,000
		1,80,000
Less :	Depreciation charged during the year	20,000
	Closing Balance of Fixed Assets	1,60,000
	Purchased during the year	2,00,000 / 40,000

Problem 3.19. Given below are the comparative Balance Sheets of a Company as on December 31, 1992 and 1993 :

Liabilities	*31st Dec.* 1992	*31st Dec.* 1993	*Assets*	*31st. Dec.* 1992	*31st Dec.* 1993
	Rs.	*Rs.*		*Rs.*	*Rs.*
Share Capital (50,000 Equity Shares of Re. 1 each fully paid	50,000	50,000	Plant at cost	20,000	25,000
			Less : Depreciation	8,000	12,000
General Reserve	—	3,000		12,000	13,000
6% Debentures	—	50,000	Freehold Property	—	1,00,000
Bank Loan	—	20,000	Investment (Long term)	15,000	—
Trade Creditors	18,000	22,000	Stock-in-trade	30,000	44,000
Proposed Dividend	3,000	—	Debtors	20,000	30,000
Provision for Taxation	6,000	8,000			
P and L A/c	15,000	35,000	Cash in hand	15,000	1,000
	92,000	1,88,000		92,000	1,88,000

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You are required to prepare for the year 1993, a statement showing the source and application of funds and schedule of changes in working capital after taking the following facts into consideration :

(a) A 8% dividend p.a. was declared during 1993.

(b) Plant sold during the year for Rs. 3,500 was originally bought for Rs. 5,000 on which Rs. 1,800 depreciation had accumulated

(c) Total Bank Loan raised during the year was Rs. 28,000.

Solution :

SCHEDULE OF CHANGES IN WORKING CAPITAL

	1992	*1993 in W.C.*	*Increase in W.C.*	*Decrease in W. C.*
	Rs.	*Rs.*	*Rs.*	*Rs.*
Current Assets :				
Cash at Bank	15,000	1,000	—	14,000
Debtors	20,000	30,000	10,000	
Stock-in-trade	30,000	44,000	14,000	
	65,000	75,000		
Current Liabilities :				
Trade Creditors	18,000	22,000	—	4,000
Proposed Dividend	3,000	—	3,000	
Provision for taxation	6,000	8,000	—	2,000
	27,000	30,000		
Working Capital (C.A.–C.L.)	38,000	45,000		
Net Increase in W.C.	7,000			7,000
	45,000	45,000	27,000	27,000

FUNDS FLOW STATEMENT

Sources	*Rs.*	*Applications*	*Rs.*
Issue of Debentures	50,000	Purchase of Plant[4]	10,000
Raising of Bank Loan	28,000	Purchase of Freehold Property	1,00,000
Sale of Plant	3,500	Repayment of Bank Loan	8,000
Sale of Investments	15,000	Net Increase in W.C.	7,000
Funds from Operations	28,500		
	1,25,000		1,25,000

Working Notes :

(1) Provision for taxation and Proposed Dividend have been considered as Current Liabilities.

(2) Bank loan raised during the year was Rs. 28,000 out of which the balance of Rs. 20,000 appears in the balance sheet. This means that the balance of Rs. 8,000 has been paid during the year. Bank Loan has been taken as a long-term Liability.

(3) Investments have been assumed to be long-term investments.

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(4) **PLANT ACCOUNT**

	Rs.		Rs.
To Balance b/d	20,000	By Cash (Sale)	3,500
To Adjusted P/L A/c (Profit on sale)	300	By Accumulated Depreciation A/c	1,800
To Cash Purchases (balancing figure)	10,000	By Balance c/d	25,000
	30,300		30,300

(5) **ACCUMULATED DEPRECIATION ACCOUNT**

	Rs.		Rs.
To Plant A/c (Dep. on Plant sold)	1,800	By Balance b/d	8,000
To Balance c/d	12,000	By Adjusted P/L A/c (balancing figure)	5,800
	13,800		13,800

(6) **ADJUSTED PROFIT & LOSS ACCOUNT**

	Rs.		Rs.
To Depreciation on Plant	5,800	By Balance b/d	15,000
To Transfer to General Reserve	3,000	By Profit on sale of Plant	300
To Balance c/d	35,000	By *Funds from Operations* (balancing figure)	28,500
	43,800		43,800

Problem 3.20. Following are the summaries of Balance Sheets of a Limited Company as on 31st December, 1994 and 1995 :

	1994 Rs.	*1995* Rs.
Paid up Share Capital	1,00,000	1,00,000
General Reserve	21,400	26,000
Profit and Loss A/c	17,000	16,000
Creditors	9,750	6,380
Provision for taxation	19,000	21,000
Provision for doubtful debts	1,000	1,200
	1,68,150	1,70,580
Buildings	46,800	45,000
Machinery	38,280	42,030
Goodwill	13,000	13,000
Investments	10,000	11,250
Stock	30,000	28,000
Debtors	22,000	22,000
Prepaid Expenses	70	300
Cash Balance	8,000	9,000
	1,68,150	1,70,580

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Additional Information :

(a) The profit for the year 1995 was Rs. 8,600 which has been arrived at after charging Rs. 3,050 by way of depreciation and increase in provision for doubtful debts Rs. 200.

(b) An interim dividend of Rs. 5,000 was paid in October 1995.

(c) Additional machinery was purchased in May 1995 for Rs. 5,000.

(d) Investments (Cost Rs. 5,000) were sold in Nov., 1995 for Rs. 4,800 and on 1st December 1995 another investment was made for Rs. 6,250.

(e) Income tax Rs. 18,000 was paid during the year and charged against the provision.

Prepare a statement showing Source and Application of Funds during the year 1995.

Solution :

SCHEDULE OF CHANGES IN WORKING CAPITAL

	1994	*1995*	*Increase in W.C.*	*Decrease in W.C.*
	Rs.	*Rs.*	*Rs.*	*Rs.*
Current Assets :				
Cash Balance	8,000	9,000	1,000	
Debtors	22,000	22,000		
Stock	30,000	28,000	—	2,000
Prepaid Expenses	70	300	230	
	60,070	59,300		
Current Liabilities :				
Creditors	9,750	6,380	3,370	
Provision for doubtful debts	1,000	1,200		200
	10,750	7,580		
Working Capital (C.A–C.L.)	49,320	51,720		
Net Increase in W.C.	2,400			2,400
	51,720	51,720	4,600	4,600

STATEMENT OF SOURCES AND APPLICATION OF FUNDS

Sources	*Rs.*	*Applications*	*Rs.*
Sale of Investment	4,800	Payment of Interim Dividend	5,000
Funds from Operations	31,850	Purchase of Machinery	5,000
		Purchase of Investments	6,250
		Payment of Income tax	18,000
		Net Increase in W.C.	2,400
	36,650		36,650

Working Notes :

(1)

BUILDINGS ACCOUNT

	Rs.		*Rs.*
To Balance b/d	46,800	By Adjusted P/L A/c (Depreciation –balancing figure)	1,800
		By Balance c/d	45,000
	46,800		46,800

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(2) **MACHINERY ACCOUNT**

	Rs.		Rs.
To Balance b/d	38,280	By Adjusted P/L A/c	
To Cash (Purchases)	5,000	(Depreciation balancing figure)	1,250
		By Balance c/d	42,030
	43,280		43,280

(3) **INVESTMENTS ACCOUNT**

	Rs.		Rs.
To Balance b/d	10,000	By Cash (sold)	4,800
To Cash (Purchased)	6,250	By Adjusted P/L A/c (Loss)	200
		By Balance c/d	11,250
	16,250		16,250

(4) **PROVISION FOR TAXATION ACCOUNT**

	Rs.		Rs.
To Cash (Tax-paid)	18,000	By Balance b/d	19,000
To Balance c/d	21,000	By P/L A/c	20,000
		(Charged during the year ; balancing figure)	
	39,000		39,000

(5) **ADJUSTED P/L ACCOUNT**

	Rs.		Rs.
To Depreciation on Building	1,800	By Balance b/d	17,000
To Depreciation on Machinery	1,250	By Funds from Operations	
To Loss on sale of Investments	200	(balancing figure)	31,850
To Provision for tax	20,000		
To Interim Dividend	5,000		
To Transfer to General Reserve (26,000-21,400)	4,600		
To Balance c/d	16,000		
	48,850		48,850

Problem 3.21 The condensed Balance Sheets of Hindustan Book Ltd. are given below :

Liabilities	*1991* Rs.	*1990* Rs.	*Assets*	*1991* Rs.	*1990* Rs.
Share Capital	40,000	36,000	Fixed Assets	52,000	48,000
General Reserve	6,000	11,000	*Less :* Depreciation	14,000	10,800
Profit and Loss A/c	3,345	2,045		38,000	37,200
Sundry Creditors	19,535	13,365	Investments at Cost	5,000	10,000
Proposed Dividend	1,500	2,880	Stocks	9,050	5,560

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Provision for taxation	3,200	5,000	Cash & Bank Balances	4,750	4,980
			Sundry Debtors	16,780	11,830
			Preliminary Expenses	—	720
	73,580	70,290		73,580	70,290

(a) The net profit for the year ; after making provision for taxation Rs. 3,200, writing off preliminary expenses Rs. 720 and providing for depreciation Rs. 3,965, amounted to Rs. 3,800.

(b) A machine purchased for Rs. 900 on 1st January, 1983 was sold for cash Rs. 300 on 1st July, 1991. Depreciation is provided on this machinery at 10% per annum on cost.

(c) A portion of the company's investment has become worthless and was written off to General Reserve. The cost of such investment was Rs. 5,000.

(d) During the year the company paid an interim dividend of Rs. 1,000 and Directors have recommended a final dividend of Rs. 1,500 for the year 1991.

Prepare a statement of Sources and Applications of Funds for the year ended 31st December, 1991 and a schedule of changes in working capital.

SCHEDULE OF CHANGES IN WORKING CAPITAL

	1990	*1991*	*Increase in Working Capital*	*Decrease in Working Capital*
	Rs.	*Rs.*	*Rs.*	*Rs.*
Current Assets :				
Cash and Bank Balances	4,980	4,750	—	230
Stock	5,560	9,050	3,490	—
Debtors	11,830	16,780	4,950	—
	22,370	30,580		
Current Liabilities :				
Sundry Creditors	13,365	19,535	—	6,170
Provision for Taxation	5,000	3,200	1,800	—
	18,365	22,735		
Working Capital (C.A–C.L.)	4,005	7,845		
Net Increase in Working Capital	3,840			3,840
	7,845	7,845	10,240	10,240

STATEMENT OF SOURCES AND APPLICATION OF FUNDS

Sources	*Rs.*	*Applications*	*Rs.*
Sale of Machinery	300	Purchase of Fixed Assets[1]	4,900
Issue of shares (40,000–36,000)	4,000	Payment of proposed dividend for 1990 (assumed to be paid	2,880
Funds from Operations	8,320	Payment of Interim dividend	1,000
		Net Increase in Working Capital	3,840
	12,620		12,620

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Workings :

(1) **FIXED ASSETS ACCOUNT (AT COST)**

	Rs.		Rs
To Balance b/d	48,000	By Cash	300
To Profit on Sale	165	By Accumulated Depreciation	765
To Cash (Purchases) (balancing figure)	4,900	By Balance c/d	52,000
	53,065		53,065

(2) **ACCUMULATED DEPRECIATION ACCOUNT**

	Rs.		Rs
To Fixed Assets A/c (Dep. on assets sold)	765	By Balance b/d	10,800
To Balance c/d	14,000	By P/L A/c (balancing figure)	3,965
	14,765		14,765

(3) **ADJUSTED PROFIT AND LOSS ACCOUNT**

	Rs.		Rs
To Depreciation	3,965	By Balance b/d	2,045
To Preliminary Expenses (written off)	720	By Profit on Sale of fixed assets	165
To Proposed dividend	1,500	By Funds from operations (balancing figure)	8,230
To Interim dividend	1,000		
To Balance c/d	3,345		
	10,530		10,530

(4) **INVESTMENTS ACCOUNT**

	Rs.		Rs
To Balance b/d	11,000	By General Reserves	5,000
		By Balance c/d	6,000
	11,000		11,000

(5) Investment have been treated as trade investments.

Problem 3.22. Following are the summarised Balance Sheets of A. Ltd., as on 31st December 1990 and 1991.

Assets	*1980* Rs.	*1981* Rs.	*Liabilities*	*1980* Rs.	*1981* Rs.
Fixed Assets	4,00,000	3,20,000	Share Capital	4,50,000	4,50,000
Investments	50,000	60,000	General Reserve	3,00,000	3,10,000
Stock	2,40,000	2,10,000	Profit & Loss	56,000	68,000
Debtors	2,10,000	4,55,000	Creditors	1,68,000	1,34,000
Bank	1,49,000	1,97,000	Provision for Taxation	75,000	10,000
			Loan (short-term)	—	2,70,000
	10,49,000	12,42,000		10,49,000	12,42,000

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Additional Information

(i) Investments costing Rs. 8,000 were sold during the year 1991 for Rs. 8,500.

(ii) Provision for taxation made during the year 1991 was Rs. 9,000.

(iii) During the year 1991, part of the fixed assets costing Rs. 10,000 was sold for Rs. for Rs. 12,000

(iv) Dividend paid during the year 1991 amounted to Rs. 40,000.

Prepare Fund Flow Statement for the year ended, 1991.

Solution :

SCHEDULE OF CHANGES IN WORKING CAPITAL

	1990	*1991*	*Increase in W.C.*	*Decrease in W.C.*
	Rs.	*Rs.*	*Rs.*	*Rs.*
Current Assets :				
Stock	2,40,000	2,10,000	—	30,000
Debtors	2,10,000	4,55,000	2,45,000	—
Bank	1,49,000	1,97,000	48,000	
	5,99,000	8,62,000		
Current Liabilities :				
Creditors	1,68,000	1,34,000	34,000	—
Loan (Short-term)	—	2,70,000	—	2,70,000
	1,68,000	4,04,000		
Working Capital (C.A.–C.L.)	4,31,000	4,58,000		
Net Increase in W.C.	27,000			27,000
	4,58,000	4,58,000	3,27,000	3,27,000

FUNDS FLOW STATEMENT

Sources	*Rs.*	*Applications*	*Rs.*
Sale of Investments	8,500	Purchase of Investments (3)	18,000
Sale of fixed assets	12,000	Dividend paid	40,000
Funds from Operations (6)	1,38,500	Taxes paid during two years (4)	74,000
		Net increase in Working Capital	27,000
	1,59,000		1,59,000

Working Notes :

(1) Provision for taxation has not been taken as a current liability. In case, it is considered as a current liability, net increase in working capital shall be Rs. 92,000.

(2) Investments are considered as trade investments.

(3) **INVESTMENT ACCOUNT**

	Rs.		*Rs.*
To Balance b/d	50,000	By Cash (Sale)	8,500
To P/L A/c (profit on Sale)	500	By Balance c/d	60,000
To Cash (Purchases) (balancing figure)	18,000		
	68,500		68,500

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(4) **PROVISION FOR TAXATION ACCOUNT**

	Rs.		Rs.
To Cash (Paid)	74,000	By Balance b/d	75,000
(balancing figure)		By P/L A/c (Provision	
To Balance c/d	10,000	credited, given)	9,000
	84,000		84,000

(5) **FIXED ASSETS ACCOUNT**

	Rs.		Rs.
To Balance b/d	4,00,000	By Cash (Sale)	12,000
To P/L A/c (Profit on sale)	2,000	By Depreciation (balancing figure)	70,000
		By Balance c/d	3,20,000
	4,02,000		4,02,000

(6) **ADJUSTED PROFIT AND LOSS ACCOUNT**

	Rs.		Rs.
To Depreciation on Fixed Assets	70,000	By Balance b/d	56,000
To Dividend	40,000	By Fixed Assets A/c	
To Provision for tax	9,000	(Profit on Sale of	
To General Reserve		fixed assets)	2,000
(3,10,000–3,00,000)	10,000	By Investments A/c	
To Balance c/d	68,000	(Profit on Sale)	500
		By Funds from Operations	
		(balancing figure)	1,38,500
	1,97,000		1,97,000

Problem 3.23 From the following Balance Sheets of Alpha Ltd., make out (1) Statement of changes in Working Capital, (2) Fund Flow Statement.

BALANCE SHEETS OF ALPHA LTD.

Liabilities	*1988* Rs.	*1989* Rs.	*Assets*	*1988* Rs.	*1989* Rs.
Equity Share Capital	3,00,000	4,00,000	Goodwill	1,00,000	80,000
			Land and Building	2,00,000	1,70,000
8% Redeemable Preference			Plant	80,000	2,00,000
Share Capital	1,50,000	1,00,000	Investments	20,000	30,000
Capital Reserve	—	20,000	Sundry Debtors	1,40,000	1,70,000
General Reserve	40,000	50,000	Stock	77,000	1,09,000
			Bills Receivable	20,000	30,000
Profit and Loss Account	30,000	48,000	Cash in hand	15,000	10,000
Proposed Dividend	42,000	50,000	Cash at bank	10,000	8,000
Sundry Creditors	25,000	47,000	Preliminary Expenses	15,000	10,000
Bills Payable	20,000	16,000			
Liabilities for Expenses	30,000	36,000			
Provision for Taxation	40,000	50,000			
	6,77,000	8,17,000		6,77,000	8,17,000

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Notes :

(1) A piece of land had been sold out in 1989 and the profit on sale has been credited to Capital Reserve.

(2) A machine has been sold out for Rs. 10,000. The written down value of the machine was Rs. 12,000. Depreciation of Rs. 10,000 is charged on plant account in 1989.

(3) The investments are trade investments. Rs. 3,000 by way of dividend is received including Rs. 1,000 from pre-acquisition profit which has been credited to Investment Account.

(4) An interim dividend of Rs. 20,000 had been paid in 1989.

(Adapted C.A. Final, B. Com. G.N.D.U.)

Solution :

STATEMENT OF CHANGES IN WORKING CAPITAL

	1988	*1989*	*Increase in W.C.*	*Decrease in W.C.*
	Rs.	*Rs.*	*Rs.*	*Rs.*
Current Assets :				
Sundry Debtors	1,40,000	1,70,000	30,000	—
Stock	77,000	1,09,000	32,000	—
Bills Receivables	20,000	30,000	10,000	—
Cash in hand	15,000	10,000	—	5,000
Cash at Bank	10,000	8,000	—	2,000
	2,62,000	3,27,000		
Current Liabilities :				
Sundry Creditors	25,000	47,000	—	22,000
Bills Payable	20,000	16,000	4,000	
Liability for Expenses	30,000	36,000	—	6,000
	75,000	99,000		
Working Capital (C.A.–C.L.)	1,87,000	2,28,000		
Net Increase in Working Capital	41,000			41,000
	2,28,000	2,28,000	76,000	76,000

FUNDS FLOW STATEMENT

Sources	*Rs.*	*Applications*	*Rs.*
Issue of Equity Shares (4,00,000–3,00,000)	1,00,000	Redemption of Preference Shares (1,50,000–1,00,000)	50,000
Sale of Land[2]	50,000	Purchase of Plant[3]	1,42,000
Sale of Machine	10,000	Purchase of Investments	11,000
Dividend Received	3,000	Payment of Interim Dividend	20,000
Funds from Operations	1,43,000	Payment of Proposed Dividend (for 1988, assumed to be paid)	42,000
		Net Increase in Working Capital	41,000
	3,06,000		3,06,000

Working Notes :

(1) Provision for taxation has not been taken as a current liability. In case, provision for taxation is taken as a current liability–Net Increase in Working Capital shall be Rs. 31,000 and Funds from Operations Rs. 1,33,000.

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(2) **LAND AND BUILDING ACCOUNT**

	Rs.		Rs
To Balance b/d	2,00,000	By Cash (sold)	50,000
To Capital Reserve	20,000	(balancing figure)	
		By Balance c/d	1,70,000
	2,20,000		2,20,000

(3) **PLANT ACCOUNT**

	Rs.		Rs
To Balance b/d	80,000	By Cash (sale)	10,000
To Cash (Purchased)	1,42,000	By Adjusted P/L A/c	2,000
(balancing figure)		(loss on Sale)	
		By Adjusted P/L A/c	10,000
		(Depreciation)	
		By Balance c/d	2,00,000
	2,22,000		2,22,000

(4) **INVESTMENTS ACCOUNT**

	Rs.		Rs
To Balance b/d	20,000	By Dividend A/c	1,000
To Cash-purchased	11,000	By Balance c/d	30,000
(balancing figure)			
	31,000		31,000

(5) **GENERAL RESERVE ACCOUNT**

	Rs.		Rs
		By Balance b/d	40,000
		By Adjusted P/L A/c	10,000
To Balance c/d	50,000	(balancing figure)	
	50,000		50,000

(6) **PROVISION FOR TAXATION ACCOUNT**

	Rs.		Rs
		By Balance b/d	40,000
		By Adjusted P/L A/c	10,000
To Balance c/d	50,000		
	50,000		50,000

(7) **PROPOSED DIVIDEND ACCOUNT**

	Rs.		Rs
To Cash		By Balance b/d	42,000
(assumed to be paid)	42,000	By Adjusted P/L A/c	50,000
To Balance c/d	50,000	(balancing figure)	
	92,000		92,000

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(8) **GOODWILL ACCOUNT**

	Rs.		Rs
To Balance b/d	1,00,000	By Adjusted P/L A/c (balancing figure)	20,000
		By Balance c/d	80,000
	1,00,000		1,00,000

(9) **PRELIMINARY EXPENSES ACCOUNT**

	Rs.		Rs
To Balance b/d	15,000	By Adjusted P/L A/c balancing figure)	5,000
		By Balance c/d	10,000
	15,000		15,000

(10) **ADJUSTED PROFIT AND LOSS ACCOUNT**

	Rs.		Rs
To Plant A/c (Loss on Sale)	2,000	By Balance b/d	30,000
To Depreciation on plant	10,000	By Dividend on Investments	2,000
To General Reserve	10,000	By Funds from Operations (balancing figure)	1,43,000
To Provision for Taxation	10,000		
To Proposed Dividend	50,000		
To Goodwill A/c	20,000		
To Preliminary Expenses	5,000		
To Interim Dividend	20,000		
To Balance c/d	48,000		
	1,75,000		1,75,000

Problem 3.24 Prepare a Fund Flow Statement from the following particulars :

Balance Sheet of X. Co. Ltd.

	1991 Rs.	1990 Rs.
Assets :		
Cash	36,000	60,000
Debtors	1,08,000	1,00,000
Stock	1,60,000	1,40,000
Investments (Marketable temporary)	—	20,000
Fixed Assets Net	2,92,000	1,79,000
Goodwill	—	20,000
	5,96,000	5,19,000
Liabilities :		
Trade Creditors	1,70,000	1,94,000
Accrued Expenses	38,000	26,000
Mortgages	60,000	40,000
Share Capital	2,60,000	2,00,000
Retained Earnings	68,000	59,000
	5,96,000	5,19,000

Additional Information :

(1) Depreciation provided during 1991 amounted to Rs. 27,000.

(2) Dividends paid in 1991 amounted to Rs. 14,000.

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Solution :

SCHEDULE OF CHANGES IN WORKING CAPITAL

	1990	*1991*	*Increase in W.C.*	*Decrease in W.C.*
	Rs.	*Rs.*	*Rs.*	*Rs.*
Current Assets :				
Cash	60,000	36,000	—	24,000
Debtors	1,00,000	1,08,000	8,000	—
Stock	1,40,000	1,60,000	20,000	—
Temporary Investments	20,000	—	—	20,000
	3,20,000	3,04,000		
Current Liabilities :				
Trade Creditors	1,94,000	1,70,000	24,000	—
Accrued Expenses	26,000	38,000	—	12,000
	2,20,000	2,08,000		
Working Capital (C.A.–C.L.)	1,00,000	96,000		
Net Decrease in W.C.	—	4,000	4,000	
	1,00,000	1,00,000	56,000	56,000

FUNDS FLOW STATEMENT

Sources	*Rs.*	*Applications*	*Rs.*
Issue of Shares[2]	60,000	Purchase of Fixed Assets[1]	1,40,000
Raising of Mortgages[3]	20,000	Payment of Dividend	14,000
Funds from Operations[4]	70,000		
Net Decrease in W.C.	4,000		
	1,54,000		1,54,000

Working Notes :

(1) **NET FIXED ASSETS ACCOUNT**

	Rs.		*Rs*
To Balance b/d	1,79,000	By Depreciation	27,000
To Cash-Purchases (balancing figure)	1,40,000	By Balance c/d	2,92,000
	3,19,000		3,19,000

(2) **SHARE CAPITAL ACCOUNT**

	Rs.		*Rs*
To Balance c/d	2,60,000	By Balance b/d	2,00,000
		By Cash–Issue (balancing figure)	60,000
	2,60,000		2,60,000

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(3) **MORTGAGES ACCOUNT**

	Rs.		Rs
To Balance c/d	60,000	By Balance b/d	40,000
		By Cash – raised (balancing figure)	20,000
	60,000		60,000

(4) **ADJUSTED PROFIT AND LOSS ACCOUNT**

	Rs.		Rs
To Depreciation	27,000	By Balance b/d	59,000
To Goodwill written of	20,000	By Funds from Operations	
To Dividend paid	14,000	(balancing figure)	70,000
To Balance c/d	68,000		
	1,29,000		1,29,000

Problem 3.25 The Balance Sheets of XYZ Co. Ltd., as at 31st Dec. 1992 and 1993 are given below :

	1992 Rs.	1993 Rs.
Assets :		
Freehold Land	1,00,000	1,00,000
Plant at Cost	1,04,000	1,00,000
Furniture at Cost	7,000	9,000
Investments at Cost	60,000	80,000
Debtors	30,000	70,000
Stock	60,000	65,000
Cash	30,000	45,000
	3,91,000	4,59,000
Liabilities and Capital :		
Share Capital	1,00,000	1,50,000
Share Premium	—	5,000
General Reserve	50,000	60,000
P & L Account	10,000	17,000
6% Debentures	70,000	50,000
Provision for Dep. on Plant	50,000	56,000
Provision for Dep. on Furniture	5,000	6,000
Provision for Taxation	20,000	30,000
Sundry Creditors	86,000	95,000
	3,91,000	4,69,000

A plant purchased for Rs. 4,000 (Depreciation Rs. 2,000) was sold for cash Rs. 8,000 on 30th September 1993. On 30th June 1993 an item of furniture was purchased for Rs. 2,000. These were the only transactions concerning fixed assets during 1993.

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Depreciation was provided on plant at 8% on cost (the sold out item is not taken into consideration) and on furniture at $12^1/_2$% on average cost. A dividend of $22^1/_2$% on original shares was paid.

Prepare a schedule of changes in Working Capital and also a statement of Sources and Applications of Funds during 1993. *(Adapted C.A. Final)*

Solution :

SCHEDULE OF CHANGES IN WORKING CAPITAL

	1992	*1993*	*Increase in W.C.*	*Decrease in W.C.*
	Rs.	*Rs.*	*Rs.*	*Rs.*
Current Assets :				
Debtors	30,000	70,000	40,000	—
Stock	60,000	65,000	5,000	—
Cash	30,000	45,000	15,000	—
	1,20,000	1,80,000		
Current Liabilities :				
Sundry Creditors	86,000	95,000	—	9,000
Provision for taxation	20,000	30,000	—	10,000
	1,06,000	1,25,000		
Working Capital (C.A.–C.l.)	14,000	55,000		
Net Increase in W.C.	41,000			41,000
	55,000	55,000	60,000	60,000

Notes :

(1) Investments have been treated as trade (long-term) investments.
(2) Provision for taxation has been treated as Current Liability.
(3) If provision for taxation is not taken as a Current Liability, Net Increase in Working Capital shall be Rs. 51,000

STATEMENT OF SOSURCES AND APPLICATIONS OF FUNDS

(for the year ended 1993)

Sources	*Rs.*	*Applications*	*Rs.*
Issue of shares[1]	50,000	Purchase of Furniture	2,000
Share Premium[2]	5,000	Purchase of Investments[2]	20,000
Sale of Plant	800	Redemption of Debentures[4]	20,000
Funds from Operations	49,700	Dividend paid ($22^1/_2$% on 1,00,000)	22,500
		Net Increase in working capital	41,000
	1,05,500		1,05,500

Working Notes :

(1) **SHARE CAPITAL ACCOUNT**

	Rs.		*Rs*
To balance c/d	1,50,000	By Balance b/d	1,00,000
		By Cash–shares issued (balancing figure)	50,000
	1,50,000		1,50,000

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(2) **SHARE PREMIUM ACCOUNT**

	Rs.		Rs
To Balance c/d	5,000	By Balance b/d	—
		By Cash Premium received (balancing figure)	5,000
	5,000		5,000

(3) **INVESTMENTS ACCOUNT**

	Rs.		Rs
To Balance b/d	60,000	By Balance c/d	80,000
To Cash-Purchased (balancing figure)	20,000		
	80,000		80,000

(4) **6% DEBENTURES ACCOUNT**

	Rs.		Rs
To Cash–redeemed (balancing figure)	20,000	By Balance b/d	70,000
To Balance c/d	50,000		
	70,000		70,000

(5) **PLANT ACCOUNT**

	Rs.		Rs
To Balance b/d	1,04,000	By Cash	800
		By Provision for dep.	2,000
		By Adjusted P/L A/c (balancing figure)	1,200
		By Balance c/d	1,00,000
	1,04,000		1,04,000

(6) **PROVISION FOR DEPRECIATION ON PLANT ACCOUNT**

	Rs.		Rs
To Plant A/c	2,000	By Balance b/d	50,000
To Balance c/d	56,000	By Adjusted P/L A/c (Dep. charged) (balancing figure)	8,000
	58,000		58,000

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(7) PROVISION FOR DEPRECIATION ON FURNITURE ACCOUNT

	Rs.		Rs
		By Balance b/d	5,000
		By Adjusted P/L A/c (balancing figure)	1,000
To Balance c/d	6,000		
	6,000		6,000

(8) FURNITURE ACCOUNT

	Rs.		Rs
To Balance b/d	7,000	By Balance c/d	9,000
To Cash	2,000		
	9,000		9,000

(9) GENERAL RESERVE ACCOUNT

	Rs.		Rs
To Balance c/d	60,000	By Balance b/d	50,000
		By Adjusted P/L A/c (balancing figure)	10,000
	60,000		60,000

(10) ADJUSTED PROFIT AND LOSS ACCOUNT

	Rs.		Rs
To Plant A/c (Loss on sale)	1,200	By Balance b/d	10,000
To Provision for Dep. on Plant	8,000	By Funds from Operations (balancing figure)	49,700
To Provision for Dep. on Furniture	1,000		
To General Reserve	10,000		
To Dividend	22,500		
To Balance c/d	17,000		
	59,700		59,700

Problem 3.26 Following are the summarised balance sheets of ESS GEE Ltd. as on December 31, 1993 and 1994.

Liabilities	*1993*	*1994*	*Assets*	*1993*	*1994*
	Rs.	Rs.		Rs.	Rs.
Share Capital	1,00,000	1,30,000	Land & Building	1,00,000	95,000
General Reserve	25,000	30,000	Machinery	75,000	84,500
Profit and Loss A/c	15,200	15,400	Stock	50,000	37,000
			Sundry Debtors	40,000	32,100
			Cash	200	300
Bank Loan (Long-term)	35,000	—	Bank	—	4,000
Sundry Creditors	75,000	67,500	Goodwill	—	7,500
Provision for tax	15,000	17,500			
	2,65,200	2,60,400		2,65,200	2,60,400

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Additional Information :

(i) Dividend of Rs. 11,500 was paid.

(ii) Assets of another company were purchased for a consideration of Rs. 30,000 payable in shares. The following assets were purchased Stock Rs. 10,000, Machinery Rs. 12,500.

(iii) Machinery was further purchased for Rs. 4,000.

(iv) Depreciation written off machinery Rs. 6,000.

(v) Income-tax provided during the year Rs. 16,500.

(vi) Loss on sale of machine Rs. 100 was written off to General Reserve.

You are required to prepare a statement of funds flow.

Solution :

SCHEDULE OF CHANGES IN WORKING CAPITAL

	1993	*1994*	*Increase in W.C.*	*Decrease in W.C.*
	Rs.	*Rs.*	*Rs.*	*Rs.*
Current Assets :				
Stock	50,000	37,000	—	13,000
Sundry Debtors	40,000	32,100	—	7,900
Cash	200	300	100	
Bank	—	4,000	4,000	
	90,200	73,400		
Current Liabilities :				
Sundry creditors	75,000	67,500	7,500	
	75,000	67,500		
Working Capital (C.A–C.L.)	15,200	5,900		
Net Decrease in W.C.		9,300	9,300	
	15,200	15,200	20,900	20,900

Note. Provision for tax has been taken as a non-current liability.

FUNDS FLOW STATEMENT

Sources	*Rs.*	*Applications*	*Rs.*
Issue of shares (for stock)	10,000	Purchase of Machine (for cash)	4,000
Sale of Machine	900	Payment of Bank Loan	35,000
Funds from Operations	44,300	Payment of Tax	14,000
Net Decrease in W.C.	9,300	Payment of Dividend	11,500
	64,500		64,500

Working Notes :

(1) Purchase of machinery and goodwill for shares is neither a source nor an application of funds as both the accounts involved are of non-current nature. But purchase of stock for issue of shares is a source as stock is a current asset and shares a non-current liability.

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(2) **SHARE CAPITAL ACCOUNT**

	Rs.		Rs
		By Balance b/d	1,00,000
		By Machinery Purchased	12,500
		By Stock (Source of funds)	10,000
		By Goodwill (balancing assets)	7,500
To Balance c/d	1,30,000		
	1,30,000		1,30,000

(3) **MACHINERY ACCOUNT**

	Rs.		Rs
To Balance b/d	75,000	By Depreciation	6,000
To Share Capital	12,500	By General Reserve (Loss on sale)	100
To Cash-purchased	4,000	By Cash-sale (balancing figure)	900
		By Balance c/d	84,500
	91,500		91,500

(4) **LAND AND BUILDING ACCOUNT**

	Rs.		Rs
To Balance b/d	1,00,000	By Depreciation (balancing figure)	5,000
		By Balance c/d	95,000
	1,00,000		1,00,000

(5) **PROVISION FOR TAX ACCOUNT**

	Rs.		Rs
To Income-Tax paid (Balancing figure)	14,000	By Balance b/d	15,000
		By Adjusted P/L A/c	
To Balance c/d	17,500	(Provision created)	16,500
	31,500		31,500

(6) **GENERAL RESERVE ACCOUNT**

	Rs.		Rs
		By Balance b/d	25,000
To Machinery Account (Loss on sale)	100	By Adjusted P/L A/c	
To Balance c/d	30,000	(balancing figure)	5,100
	30,100		30,100

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(7) **ADJUSTED PROFIT AND LOSS ACCOUNT**

	Rs.		Rs
To Depreciation on land and building	5,000	By Balance b/d	15,200
To Provision for tax	16,500	By Funds from Operations (balancing figure)	44,300
To General Reserve	5,100		
To Depreciation on machinery	6,000		
To Dividend	11,500		
To Balance c/d	15,400		
	59,500		59,500

Problem 3.27. The financial position of M/s A and B on Jan. 1 and Dec. 31 1994 was as follows :

Liabilities	*Jan. 1*	*Dec. 31*	*Assets*	*Jan. 1*	*Dec. 31*
	Rs.	Rs.		Rs.	Rs.
Sundry Creditors	36,000	40,600	Cash	4,000	3,600
Mrs. A's Loan	—	20,000	Debtors	35,000	38,000
Loan from Bank	30,000	25,000	Stock	25,000	22,000
Hire Purchase Vendor		20,000	Land	20,000	30,000
Capital	1,48,000	1,54,000	Building	50,000	55,000
			Machinery	80,000	86,000
			Delivery Van	—	25,000
	2,14,000	2,59,600		2,14,000	2,59,600

The delivery van was purchased in December 1994 on hire-purchase basis ; a payment of Rs. 5,000 was made immediately and the balance of the amount is to be paid in 20 monthly instalments of Rs. 1,000 each together with interest @ 12% p.a. During the year partners withdrew Rs. 26,000 for domestic expenditure. The provision for depreciation against machinery as on 1-1-91 was Rs. 27,000 and Rs. 36,000 on 31.12.1994. *(Punjabi and G.N.D.U.)*

Solution :

SCHEDULE OF CHANGES IN WORKING CAPITAL

Particulars	*1.1.1994*	*31.12.1995*	*Increase in W.C.*	*Decrease in W.C.*
	Rs.	Rs.	Rs.	Rs.
Current Assets :				
Cash	4,000	3,600		400
Debtors	35,000	38,000	3,000	
Stock	25,000	22,000		3,000
Total Current Assets	64,000	63,600		
Sundry Creditors	36,000	40,600		4,600
Liability for Delivery Van*		12,000		12,000
Total Current Liabilities	36,000	52,600		
(C.A.–C.L.)	28,000	11,000		
Decrease in Working Capital		17,000	17,000	
	28,000	28,000	20,000	20,000

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*Rs. 12,000 will be due in the next year @ Rs. 1,000 per month ; so this amount will be treated as a current liability. Rs. 8,000, the balance amount, will be due in the subsequent year ; so it will be treated as a long-term liability and will become a source in Funds Flow Statement.

Funds From Operations

In case of a Sole Trader and a Partnership concern, funds from operations are calculated as follows :

		Rs.
	Capital at the end of the year	
Add :	Drawings during the year	
Less :	Capital in the beginning of the year	
	Profit during the year	
Add :	Depreciation	
Add :	Fictitious assets written off	
	Funds From operations	

Funds from Operations in this case are :

		Rs.
	Capital as on 31st Dec., 1994	1,54,000
Add :	Drawings during the year	26,000
		1,80,000
Less :	Capital as on 1.1.1994	1,48,000
	Profit for the year	32,000
Add :	Depreciation for the year (36,000–27,000)	9,000
	Funds from Operations	41,000

FUNDS FLOW STATEMENT

Sources	*Rs.*	*Applications*	*Rs.*
Funds from Operations	41,000	Purchase of Land	10,000
Loan from Mrs. A	20,000	Purchase of Building	5,000
Hire-purchase vendor	8,000	Purchase of Van	25,000
Decrease in W.C.	17,000	Purchase of Plant and Machinery	15,000
		Payment of Loan	5,000
		Drawings	26,000
	86,000		86,000

MACHINERY ACCOUNT

	Rs.		*Rs.*
To Balance b/d (80,000 + 27,000)	1,07,000	By Balance c/d (86,000 + 36,000)	1,22,000
To Cash–Purchase	15,000		
	1,22,000		1,22,000

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Problem 3.28 Prepare a Funds Flow Statement from the following data :

	31.12.1991	*31.12.1992*
	Rs.	*Rs.*
Cash	2,000	2,500
Accounts receivable	2,400	2,700
Inventories	3,100	3,200
Other current Assets	800	700
Fixed assets	5,000	5,800
Accumulated depreciation	2,100	2,500
Accounts payable	2,000	2,100
Long-term debt	1,400	1,300
Equity capital	5,000	5,300
Retained earnings	2,800	3,700

Notes :

(a) Fixed assets costing Rs. 1,200 were purchased for cash.

(b) Fixed assets (original cost Rs. 400, accumulated depreciation Rs. 150) were sold for Rs. 200.

(c) Depreciation for the year 1992 amounted to Rs. 550 and duly debited to Profit and Loss Account.

(d) Dividends paid amounted to Rs. 300 in 1992.

(e) Reported income for 1992 was Rs. 1,200.

Solution :

SCHEDULE OF CHANGES IN WORKING CAPITAL

	1991	*1992*	*Increase in W.C.*	*Decrease in W.C.*
	Rs.	*Rs.*	*Rs.*	*Rs.*
Current Assets :				
Cash	2,000	2,500	500	—
Accounts Receivables	2,400	2,700	300	
Inventories	3,100	3,200	100	—
Other Current Assets	800	700	—	100
	8,300	9,100		
Current Liabilities :				
Accounts Payable	2,000	2,100	—	100
	2,000	2,100		
Working Capital C.A.–C.L.)	6,300	7,000		
Net Increase in W.C.	700			700
	7,000	7,000	900	900

FUNDS FLOW STATEMENT

Sources	*Rs.*	*Applications*	*Rs.*
Issue Equity Capital	300	Purchase of Fixed Assets	1,200
Sale of Fixed Assets	200	Payment of long term debt	100
Funds from Operations (1)	1,800	Dividend paid	300
		Net Increase in W.C.	700
	2,300		2,300

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Working Note :

1. Calculation of Funds from Operations :	*Rs.*
Retained Earnings on 31.12.1992	3,700
Add : Non-fund and non-operating items charged to P/L A/c :	
Depreciation	550
Dividend paid	300
Loss on Sale of Fixed Assets (400–150–200)	50
	4,600
Less : Retained Earnings on 31.12.1991	2,800
Funds from operations	1,800

Problem 3.29 From the following Balance Sheet of a company, you are required to prepare *(i)* a statement showing changes in working capital, and *(ii)* a statement of sources and applications of funds.

Particulars	*January 1994 Rs.*	*December 1994 Rs.*
Cash	40,000	44,400
Accounts Receivable	10,000	20,700
Inventories	15,000	15,000
Land	4,000	4,000
Buildings	20,000	16,000
Equipment	15,000	17,000
Accumulated Depreciation	(5,000)	(2,800)
Patents	1,000	900
	1,00,000	1,15,200
Current Liabilities	30,000	32,000
Bonds Payable	22,000	22,000
Bonds Payble Discount	(2,000)	(1,800)
Capital Stock	35,000	43,500
Retained Earnings	15,000	19,500
	1,00,000	1,15,200

Additional Information :

(1) Income for the period Rs. 10,000.
(2) A building that cost Rs. 4,000 and which has a book value of Rs. 1000 was sold for Rs. 1,400.
(3) The depreciation charge for the period was Rs. 800.
(4) There was Rs. 5,000 issue of common stock.
(5) Cash dividends Rs. 2,000 and a Rs. 3,500 stock dividend were declared.

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Solution :

SCHEDULE OF CHANGES IN WORKING CAPITAL

	Jan. 1994	*Dec. 1994*	*Increase in W.C.*	*Decrease in W.C.*
	Rs.	*Rs.*	*Rs.*	*Rs.*
Current Assets :				
Cash	40,000	44,400	4,400	—
Accounts Receivable	10,000	20,700	10,700	—
Inventories	15,000	15,000	—	—
Total of Current Assets	65,000	80,100		
Current Liabilities	30,000	32,000	—	2,000
Working Capital (C.A.–C.L.)	35,000	48,100		
Net Increase in W.C.	13,100			13,100
	48,100	48,100	15,100	15,100

STATEMENT OF SOURCES AND APPLICATIONS OF FUNDS

Sources	*Rs.*	*Applications*	*Rs.*
Issue of Capital Stock	5,000	Payment of Cash Dividend	2,000
Sale of Building	1,400	Purchase of Equipment (17,000–15,000)	2,000
Funds from Operations	10,700	Net Increase in W.C.	13,100
	17,100		17,100

Working Notes :

(1) **CAPITAL STOCK A/C**

	Rs.		*Rs.*
		By Balance b/d	35,000
		By Cash (Issue)	5,000
To Balance c/d	43,500	By Adjusted P/C A/c (Stock dividend)	3,500
	43,500		43,500

(2) Stock dividend of Rs. 3500 is neither shown as a source nor application of funds as both the accounts involved are non-current.

(3) **BUILDING A/C**

	Rs.		*Rs.*
To Balance b/d	20,000	By Cash (Sale)	1,400
		By Accumulated Depreciation	3,000
To Adjusted P/C A/c (Profit on Sale)	400	By Balance c/d	16,000
	20,400		20,400

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(4) **EQUIPMENT A/C**

	Rs.		Rs.
To Balance b/d	15,000		
To Cash-Purchased (balancing figure)	2,000	By Balance c/d	17,000
	17,000		17,000

(5) **ACCUMULATED DEPRECIATION A/C**

	Rs.		Rs.
To Building A/c (Depreciation on building sold)	3,000	By Balance b/d	5,000
		By Adjusted P/L A/c (Dep. charged during the year)	800
To Balance c/d	2,800		
	5,800		5,800

(6) **PATENTS A/C**

	Rs.		Rs.
To Balance b/d	1,000	By Adjusted P/C A/c (balancing figure)	100
		By Balance c/d	900
	1,000		1,000

(7) **BONDS PAYABLE DISCOUNT A/C**

	Rs.		Rs.
To Balance b/d	2,000	By Adjusted P/L A/c (balancing figure)	200
		By Balance c/d	1,800
	2,000		2,000

(8) **ADJUSTED PROFIT AND LOSS A/C**

	Rs.		Rs.
To Accumulated Depreciation	800	By Balance b/d	15,000
To Cash - Dividend	2,000	By Profit on sale of Building	400
To Stock-Dividend	3,500		
To Patents Writte off	100	By Funds from Operations (balancing figure)	10,700
To Discount (Written off)	200		
To Balance c/d	19,500		
	26,100		26,100

Problem 3.30 The following is the Balance Sheet of Rajmata Auto Electricals Ltd :

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	31st March 1992 Rs. (Lakhs of Rs.)	*31st March 1991 Rs. (Lakhs of Rs.)*
Liabilities :		
Preference Shares (5%)	410	400
Ordinary Shares	1,435	1,199
Capital Suspense Account	—	40
Reserve and Surplus	1,028	996
Mortgage Debentures	966	966
Loans (long-term)	1,395	836
Cash Credit and Bank Overdraft	2,117	1,855
Fixed Deposit	298	328
Short-term Loans	22	30
Provision for taxation	493	486
Sundry Creditors	1,070	770
Other Current Liabilities	675	432
	9,409	7,838
Assets :		
Net Fixed Assets	3,802	3,192
Investments	17	15
Tools	602	487
Stock	3,656	3,213
Sundry Debtors	445	652
Instalment Sale Receivables	232	134
Loan and Advances	646	134
Cash and Bank Balance	9	11
	9,409	7,838

The profit after tax amounted to Rs. 482 lakhs for the year ending 31st March 1992. Out of this amount, a sum of Rs. 450 lakhs was used for payment of dividend and the balance of Rs. 32 lakhs was carried to the Reserves and Surplus Account. You are required to prepare a statement of Sources and Application of Funds.

Solution :

SCHEDULE OF CHANGES IN WORKING CAPITAL

	1991 (Lakhs of Rs.)	*1992 (Lakhs of Rs.)*	*Increase in W.C. (Lakhs of Rs.)*	*Decrease in W.C. (Lakhs of Rs.)*
Current Assets :				
Investments	15	17	2	—
Tools	487	602	215	—
Stock	3,213	3,656	443	
Sundry Debtors	652	445	—	207
Instalment Sale Receivable	134	232	98	—
Loan and Advances	134	646	512	
Cash and Bank Balance	11	9	—	2
	4,646	5,607		

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Current Liabilities :				
Cash Credits and Bank Overdrafts	1,885	2,117	—	262
Short-term Loans	30	22	8	—
Provision for Taxation	486	493	—	7
Sundry Creditors	770	1,070	—	300
Other Current Liabilities	432	675	—	243
	3,573	4,377		
Working Capital (C.A.–C.L.)	1,073	1,230		
Net increase in W.C.	157			157
	1,230	1,230	1,178	1,178

FUNDS FLOW STATEMENT

Sources	*Rs. (in Lakhs)*	*Application*	*Rs. (in Lakhs)*
Issue of Preference share (1) (410–400)	10	Purchase of Fixed Assets (5)	610
Issue of Ordinary shares (2) (236–40)	196	Payment of Dividend	450
Raising of Loans (Long term) (3)	559	Payment of Fixed Deposits (6)	30
Funds from operations (4)	482	Net Increase in W.C.	157
	1,247		1,247

Working Notes :

(1) *Issue of Preference Shares :*

	(Rs. in Lakhs)
Opening balance of Pref. Shares	400
Closing Balance of Pref. Shares	410
Issued during the year (balancing figure)	10

(2) *Issue of Ordinary Shares :*

Opening Balance	1,199
Closing Balance	1,435
Issued during the year	236
Less : Issued against Capital Suspense A/c*	40
	196

*Rs. 40 lakhs appeared in Capital Suspense Account as a credit balance in 1991, but in 1992 the balance is nil. In the absence of any other information it has been assumed that it has been utilised to issue ordinary shares.

(3) *Raising of Long-term Loans :*

	(Rs. in Lakhs)
Opening Balance	836
Closing Balance	1,395
Loans raised during the year	559

(4) *Funds from Operations :*

Profit after tax (but before payment of dividend) is given to be Rs. 482 lakhs. There is no information given as regards payment of tax, provision for depreciation, etc. Hence the profits given have been considered as funds from operations.

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(5) *Purchase of Fixed Assets :*

	(Rs. in Lakhs)
(Net Fixed Assets) Opening Balance	3,192
Closing Balance	3,802
Purchased during the year	610

As no information as regards provision for depreciation is given, the balancing figure has been considered as purchases.

(6) *Payment of Fixed Deposits :*

(assumed to be long-term liability)	*(Rs. in Lakhs)*
Opening Balance	328
Closing Balance	298
Paid during the year	30

(7) Cash Credits, Bank Overdrafts and Provision for Taxation have been taken as Current Liabilities.

(8) Investments have been assumed to be short-term investments and loans and advances have also been taken as Current Assets.

Problem 3.31. From the following Balance Sheets of 'SYPPD' Ltd., prepare Funds Flow Statement for 1992 :

		(Rs. in thousands)
	31st March	*31st March*
Liabilities :	1991	1992
Equity Share Capital	150	200
9% Redeemable Preference Shares	75	50
Capital Reserve	—	10
General Reserve	20	25
Profit and Loss Account	15	24
Proposed Dividend	21	25
Sundry Creditors	13	24
Bills Payable	10	8
Liability for Expenses	15	18
Provision for Tax	20	25
	339	409
Assets :		
Goodwill	50	40
Land and Buildings	100	85
Plant	40	100
Investments (Long-term)	10	15
Sundry Debtors	70	85
Stock	39	55
Bills Receivable	10	15
Cash in hand	7	5
Cash at bank	5	4
Preliminary Expenses	8	5
	339	409

Additional Information :

(i) A part of land was sold out in 1992, and the profit was credited to Capital Reserve.

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(ii) A machine has been sold for Rs. 5,000 (written down value of the machine was Rs. 6,000). Depreciation of Rs. 5,000 was charged on plant in 1992.

(iii) An interim dividend of Rs. 10,000 was paid in 1992.

(iv) An amount of Rs. 1,000 has been received by way of dividend on investment in 1992.

Solution :

SCHEDULE OF CHANGES IN WORKING CAPITAL

(Rs. in thousands)

	1991	*1992*	*Increase in W.C.*	*Decrease in W.C.*
Current Assets :				
Sundry Debtors	70	85	15	—
Stock	39	55	16	—
Bills Receivable	10	15	5	—
Cash in hand	7	5	—	2
Cash at bank	5	4	—	1
	131	164		
Current Liabilities				
Sundry Creditors	13	24	—	11
Bills Payable	10	8	2	—
Liability for Expenses	15	18	—	3
	38	50		
Working Capital (C.A.–L.C.)	93	114		
Net Increase in W.C.	21			21
	114	114	38	38

FUNDS FLOW STATEMENT

(For the year ended 31st March, 1992)

(Rs. in thousands)

Sources	*Amount*	*Applications*	*Amount*
	Rs.		*Rs.*
Issue of Equity Shares	50	Redemption of Preference Shares	25
Sale of Land	25	Investments Purchased	5
Sale of Machinery	5	Purchase of Plant	71
Dividend Received	1	Payment of Interim Dividend	10
Funds from Operations	92	Payment of Tax (assumed to be paid for 1991)	20
		Payment of Proposed Dividend (assumed to be paid for 1991)	21
		Net Increase in W.C.	21
	173		173

Note :

Provision for taxation and proposed dividend have not been treated as current liabilities.

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Working Notes :

PLANT ACCOUNT

To Balance b/d	40	By cash (sale)	5
To Cash (Purchased during the year balancing figure	71	By P/L A/c (Loss)	1
		By Provision for depreciation	5
		By Balance c/d	100
	111		111

INVESTMENT ACCOUNT

To Balance b/d	10	By Balance c/d	15
To Cash (Purchased during the year (balancing figure)	5		
	15		15

ADJUSTED PROFIT AND LOSS ACCOUNT

To Depreciation on Plant	5	By Balance b/d	15
To Preliminary Expenses	3	By Dividend on Investments	1
To Goodwill written off	10	By Funds from operations	92
To Provision for tax	25		
To Proposed Dividend	25		
To Interim Dividend	10		
To Loss on Sale of Plant	1		
To Balance c/d	24		
	108		108

Problem 3.32. The following are the summarised financial statements of Madras Electronics Ltd. :

BALANCE SHEETS

as on 31st December

Liabilities	1992 *Rs.*	1993 *Rs.*	Assets	1992 *Rs.*	1993 *Rs.*
Share Capital	10,000	10,000	Fixed Assets		
Debentures	20,000	20,000	(less Depreciation)	40,000	45,000
Retained Earnings	15,000	20,000	Inventories	12,500	15,000
Sundry Creditors	9,000	10,000	Accounts Receivable	6,500	5,000
Bills Payable	4,000	5,000	Cash	4,000	5,000
Outstanding Wages	2,000	3,000			
Accrued Taxes	3,000	2,000			
	63,000	70,000		63,000	70,000

Income Statement for 1993 :

	Rs.	*Rs.*
Sales		1,00,000
Cost of Goods Sold	50,000	
Administrative & Selling Expenses	15,000	

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Depreciation	3,000	
Interest	2,000	70,000
Net Income Before Taxes		30,000
Taxes		15,000
Net Income After Taxes		15,000

Prepare for the year ended 31st December, 1993 :

(a) A Statement of Sources and Application of funds.

(b) A Statement showing the changes in Working Capital.

(Adapted Madras University, M. Com.)

Solution :

STATEMENT OF CHANGES IN WORKING CAPITAL

	1992	1993	*Increase in* W.C.	*Decrease in* W.C.
Current Assets :	*Rs.*	*Rs.*	*Rs.*	*Rs.*
Inventories	12,500	15,000	2,500	—
Accounts Receivable	6,500	5,000	–	1,500
Cash	4,000	5,000	1,000	—
	23,000	25,000		
Current Liabilities :				
Sundry Creditors	9,000	10,000	—	1,000
Bills Payable	4,000	5,000	—	1,000
Outstanding Wages	2,000	3,000	—	1,000
Accrued Taxes	3,000	2,000	1,000	—
	18,000	20,000		
Working Capital (C.A.–C.L.)	5,000	5,000	—	—
Net Increase/Decrease in W.C.	Nil	Nil	—	—
	5,000	5,000	4,500	4,500

FUNDS FLOW STATEMENT

Sources	*Rs.*	*Applications*	*Rs.*
Funds from Operations[3]	8,.000	Purchase of Fixed Assets	8,000
	8,000		8,000

Working Notes :

1. Accrued Taxes have been considered as a Current Liability and hence shown in statement of changes in working capital. So, no treatment is required in Adjusted Profit and Loss Account.

2. **FIXED ASSETS ACCOUNT**

	Rs.		*Rs.*
To Balance b/d	40,000	By Derepciation	3,000
To Cash Purchase (balancing figure)	8,000	By Balance c/d	45,000
	48,000		48,000

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3. **ADJUSTED PROFIT AND LOSS ACCOUNT**

	Rs.		*Rs.*
To Depreciation	3,000	By Balance b/d	15,000
To Balance c/d	20,000	By Funds from Operations (balancing figure)	8,000
	23,000		23,000

Problem 3.32. From the following data prepare a statement of sources and uses of funds :

DECEMBER 31, (RS. IN '000)

	1991 *Rs.*	1990 *Rs.*		1991 *Rs.*	1990 *Rs.*
Accumulated Depreciation	275	150	Cash	315	285
Creditors	100	75	Marketable Securities	106	50
Bills Payable	50	25	Debtors (Net)	150	125
Debentures	500	250	Investments[1] (long-term)	70	110
Equity Capital	550	400	Inventories	95	70
Premium on shares	60	—	Machinery	500	350
Retained Earnings	336	325	Buildings	600	200
			Land	35	35
	1,871	1,225		1,871	1,225

INCOME STATEMENT

Year end December 31, 1991

(Rs. in '000)

	Rs.	*Rs.*
Sales		600
Cost of Goods sold		337
Gross Margin of Sales		263
Operating Expenses :		
Depreciation—machinery	50	
—buildings	80	
Other Expenses	100	230
Net margin from opreations		33
Gain of sale of long-term investments		12
Total		45
Loss on sale of machinery (Proceeds from sales Rs. 14,000)		5
Net Income		40

(M. Com., Delhi)

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Solution :

SCHEDULE OF CHANGES IN WORKING CAPITAL

(Rs. in '000)

	1990	1991	*Increase in* W.C.	*Decrease in* W.C.
Current Assets :	*Rs.*	*Rs.*	*Rs.*	*Rs.*
Cash	285	315	30	—
Marketable Securities	50	106	56	—
Debtors	125	150	25	—
Inventories	70	95	25	
	530	666		
Current Liabilities :				
Creditors	75	100	—	25
Bills Payable	25	50	—	25
	100	150		
Working capital (C.A.–C.L.)	430	516		
Net Increase in W.C.	86			86
	516	516	136	136

STATEMENT OF SOURCES AND USES OF FUNDS

(Rs. in '000)

Sources	*Rs.*	*Applications*	*Rs.*
Issue of Shares	150	Purchase of Building	400
Share Premium	60	Purchase of Machinery	175
Issue of Debentures	250	Payment of Dividend/	
Sale of Machinery	15	Drawings/Tax	29
Sale of Investments	52	Net Increase in W.C.	86
Funds from Operations	163		
	690		690

Working Notes :

1. **EQUITY CAPITAL ACCOUNT**

	Rs.		*Rs.*
		By Balance b/d	400
		By Cash–Issue	
To Balance c/d	550	(balancing figure)	150
	550		550

2. **SHARE PREMIUM ACCOUNT**

	Rs.		*Rs.*
		By Balance b/d	—
		By Cash (Premium recd.)	
To Balance c/d	60	(balancing figure)	60
	60		60

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3. DEBENTURES ACCOUNT

	Rs.		Rs.
		By Balance b/d	250
		By Cash–Issue	
To Balance c/d	500	(balancing figure)	250
	500		500

4. MACHINERY ACCOUNT

	Rs.		Rs.
To Balance b/d	350	By Cash-sale	15
		By Adjusted P/L A/c	
		(Loss on Sale)	5
To Cash–Purchase		By Depreciation on	
(balancing figure)	175	machinery sold	5
		By Balance c/d	500
	525		525

5. ACCUMULATED DEPRECIATION ACCOUNT

	Rs.		Rs.
By Depreciation on		By Balance b/d	150
machinery sold		By Adjusted P/L A/c	
(balancing figure)	5	Dep. on Machinery	50
To Balance c/d	275	Dep. on buildings	80
	280		280

6. INVESTMENTS ACCOUNT

	Rs.		Rs.
By Balance b/d	110	By Cash-Sale	52
To Adjusted P/L A/c		By Balance c/d	70
(gain on sale)	12		
	122		122

7. BUILDINGS ACCOUNT

	Rs.		Rs.
By Balance b/d	200	By Balance c/d	600
To Cash-Additions			
(balancing figure)	400		
	600		600

8. RETAINED EARNINGS ACCOUNT

	Rs.		Rs.
To Cash (balancing figure)*	29	By Balance b/d	325
		By Net Income (given)	40
To Balance c/d	336		
	365		365

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* The Difference of Rs. 29,000 in Retained Earnings account is a payment. Since, it is not given in the question the payment may be dividend, drawings or tax.

8. **ADJUSTED PROFIT AND LOSS ACCOUNT**

	Rs.		Rs.
To Loss on sale of Machinery	5	By Balance b/d	325
		By Gain on sale of investments	12
To Depreciation on machinery	50	By Funds from Operations	
On buildings		(balancing figure)	163
To Depreciation	80		
To Dividend/Drawings/ Tax-paid	29		
To Balance c/d	336		
	500		500

Problem 3.34 The following Balance Sheets are related to M/s XL Ltd.

(In thousands of Rupees)

			Previous year	*Current year*
Assets :				
Cash			800	888
Sundry Debtors			200	370
Raw Materials and Stores			160	224
Finished Stock			140	120
Plant and Machinery			300	340
Land			80	80
Buildings			400	320
Patents			20	18
			2,100	2,360
Liabilities and Capital :				
Current Liabilities			600	640
Provision for Depreciation			100	56
Debentures	440	440		
Less : Discount	40	36	400	404
Reserve and Surplus			300	390
Share Capital			700	870
			2,100	2,360

The following additional information is available :

	Rs.
Net Profit after tax	2,00,000
Dividend Paid	40,000
Depreciation Charged to Profits	16,000
Ordinary Shares issued	1,00,000
Bonus Shares issued	70,000
Building sold	28,000

Original Cost Rs. 80,000
Net Book value Rs. 20,000

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Prepare a Schedule of Changes in Working Capital and a statement of Sources and Application of Funds.

Solution :

SCHEDULE OF CHANGES IN WORKING CAPITAL

(Rs. in thousands)

	Previous Year	*Current Year*	*Increase in Working Capital*	*Decrease in Working Capital*
Current Assets :	*Rs.*	*Rs.*	*Rs.*	*Rs.*
Cash	800	888	88	—
Sundry Debtors	200	370	170	—
Raw Materials and Stores	160	224	64	
Finished Stock	140	120	—	20
	1,300	1,602		
Current Liabilities	600	640	—	40
Working Capital (C.A.–C.L.)	600	640		
	700	962	—	
Net Increase in W.C.	262			262
	962	962	322	322

STATEMENT OF SOURCES AND APPLICATION OF FUNDS

(Rs. in thousands)

Sources	*Rs.*	*Applications*	*Rs.*
Issue of Ordinary Shares	100	Purchase of plant and machinery[1]	40
Sale of Building	28	Payment of Dividend	40
Funds from Operations[2]	214	Net Increase in Working Capital	262
	342		342

Working Notes :

(1) Purchase of Plant and Machinery :

Opening Balance	300
Closing Balance	340
Purchased during the year	40

PLANT AND MACHINERY ACCOUNT

	(Rs. '000)		*(Rs. '000)*
To Balance b/d	300	By Balance c/d	340
To Purchased during the year (balancing figure)	40		
	340		340

(2) Calculation of Funds from Operations : (Rs. '000)

Reserves & Surplus (Current year)	390
Add : Non-fund/Non-operation items :	
Depreciation	16

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	Dividend paid		40
	Issue of bonus shares		70
	Discount on Issue of Debentures written off (40–36)		4
	Patents written off (20–18)		2
			522
Less :	Opening Balance of Reserves and Surplus (Previous year)	300	
	Profit on sale of Building (28–20)	8	308
	Funds from operations		214
	OR		
	Net Profit after tax		200
Add :	Non-fund/Non-operating items charged to P/L A/c :		
	Depreciation		16
	Patents written off		2
	Discount written off		4
			222
Less :	Non-operating/Non-fund incomes credited to P/L A/c :		
	Profit on sale of Buildings (28–20)		8
			214

Problem 3.35 Balance Sheets and income statement of ABC Ltd. as on December 31, 1992 and 1993 are as follows :

Liabilities	1992 *Rs.*	1993 *Rs.*	*Assets*	1992 *Rs.*	1993 *Rs.*
Accounts Payable	30,000	50,000	Cash Balance	10,000	4,000
Cash Credit	26,000	20,000	Accounts Receivable	20,000	16,000
Outstanding Expenses	4,000	6,000	Loans and Advances (Short-term)	10,000	—
Long-term Loan	60,000	40,000			
Capital	60,000	60,000	Inventories	40,000	50,000
Surplus	20,000	24,000	Fixed Assets (Net)	1,20,000	1,30,000
	2,00,000	2,00,000		2,00,000	2,00,000

Income Statement

for the year 1993

		Rs.
Sales		4,00,000
Less :	Cost of goods sold (including depreciation Rs. 20,000)	3,40,000
	Gross Profit	60,000
Less :	Other expenses	40,000
	Income before tax	20,000

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Less :	Provision for tax	10,000
	Retained Earnings	10,000

Prepare a statement of sources and uses of funds.

Solution :

SCHEDULE OF CHANGES IN WORKING CAPITAL

(Rs. in thousands)

	1992	*1993*	*Increase in W.C.*	*Decrease in W.C.*
Current Assets :	*Rs.*	*Rs.*	*Rs.*	*Rs.*
Cash balance	10,000	4,000	—	6,000
Accounts Receivable	20,000	16,000	—	4,000
Loans and Advances	10,000	—	—	10,000
Inventories	40,000	50,000	10,000	
	80,000	70,000		
Current Liabilities :				
Accounts Payable	30,000	50,000	—	20,000
Cash Credit	26,000	20,000	6,000	
Outstanding Expenses	4,000	6,000	—	2,000
	60,000	76,000		
Working Capital (C.A.–C.L)	20,000	–6,000		
Net Decrease in W.C.		26,000	26,000	
	20,000	20,000	42,000	42,000

STATEMENT OF SOURCES AND USES OF FUNDS

Sources	*Rs.*	*Applications*	*Rs.*
Funds from Operations	40,000	Repayment of long-term Loan	
Net Decrease in W.C.	26,000	(60,000–40,000)	20,000
		Purchase of Fixed Assets[1]	30,000
		Payment of Dividend[2]	6,000
		Payment of tax	10,000
	66,000		66,000

Working Notes :

(1) **FIXED ASSETS ACCOUNT**

	Rs.		*Rs.*
To Balance b/d	1,20,000	By Depreciation	20,000
To Cash-Purchased		By Balance c/d	1,30,000
(balancing figure)	30,000		
	1,50,0000		1,50,000

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(2) **SURPLUS ACCOUNT**

	Rs.		*Rs.*
To Cash-Dividend Paid (assumed)		By Balance b/d	20,000
balancing figure	6,000	By P/L A/c	10,000
To Balance c/d	24,000		
	30,000		30,000

(3) Income-tax provision of Rs. 10,000 created during the year does not appear as a liability in the given statement ; hence it is assumed that the same has been paid during the year as tax.

(4) Calculation of Funds from Operations :

	Rs.
Income before-tax (given)	20,000
Add : Depreciation being non-fund	20,000
	40,000

Problem 3.36 From the following particulars, prepare a statement of sources and application of funds :

		(Lakhs of Rupees)	
	Profit before depreciation		30
Less :	Depreciation	10	
	Taxation	10	
	Dividend	1	
	Transfer to Reserves	7	28
	Balance of P & L Account		2

BALANCE SHEET

(Rs. in lakhs)

Liabilities	1993	1994	*Assets*	1993	1994
Share Capital	50	60	Fixed Assets	80	85
Reserves	30	37	Current Assets :		
P & L Account	—	2	Stock	20	30
Secured Loans	18	28	Debtors	30	42
Unsecured Loans	20	12	Cash & Bank	5	8
Current Liabilities & Provisions	17	26			
	135	165		135	165

Solution : SCHEDULE OF CHANGES IN WORKING CAPITAL

(Rs. in Lakhs)

	1993	1994	Increase in W.C.	Decrease in W.C.
Current Assets :				
Stock	20	30	10	—
Debtors	30	42	12	—
Cash and Bank	5	8	3	—
	55	80		
Current Liabilities :				
Current Liabilities & Provisions	17	26		9
	17	26		
Working Capital (C.A.–C.L.)	38	54		
Net Increase in W.C.	16			16
	54	54	25	25

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FUNDS FLOW STATEMENT

(Rs. in Lakhs)

Sources	*Amount*	*Applications*	*Amount*
Issue of Share Capital (60–50)	10	Payment of Unsecured Loans (20–12)	8
Raising of Secured Loans (28–18)	10	Purchase of Fixed Assets (1)	15
Funds from Operations (2)	30	Payment of Dividend	1
		Payment of taxes	10
		Net increase in W.C.	16
	50		50

Working Notes :

(1) **FIXED ASSETS ACCOUNT**

	(Rs. in Lakhs)		*(Rs. in Lakhs)*
To Balance b/d	80	By Depreciation	10
To Cash-Purchase (balancing figure)	15	By Balance c/d	85
	95		95

(2) **ADJUSTED PROFIT AND LOSS ACCOUNT**

			(Rs. in Lakhs)
To Depreciation	10	By Opening balance	Nil
To Taxation	10	By Funds from operations	30
To Dividend	1		
To Transfers to Reserves	7		
To Balance c/d	2		
	30		30

Problem 3.37 A statement of retained earnings of ABC Ltd. is given below :

		Rs.
	Balance of retained earnings, July 1, 1993	41,72,800
Add :	Net income after income tax	83,26,600
	Tax refund	2,84,300
		1,27,83,700
Less :	Dividends	58,52,100
	Write off cost of investments in foreign subsidiary	12,23,000
	Loss on Sale of Plant equipment	1,33,400
		72,08,500
	Balance of retained earnings, June 30, 1994	55,75,200

(a) Depreciation of Rs. 7,95,200 was deducted in arriving at net income for the fiscal year.

(b) Plant equipment having a net book value of Rs. 4,32,100 was sold in August, 1993.

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(c) Plant properties were increased during the fiscal year at a cost of Rs. 23,19,000 and the increases were financed by notes due in 1998.

(d) Preference shares were retired for Rs. 7,64,000.

You are required to prepare a statement of the sources and uses of net working capital for the year ended June 30, 1994. *(M. Com. Delhi)*

Solution :

STATEMENT OF SOURCES AND USES OF NET WORKING CAPITAL

Sources	*Rs.*	*Applications*	*Rs.*
Sale of Plant [1]	2,98,700	Redemption of Preference Shares	7,64,000
Tax Refund	2,84,300		
Funds from Operations [2]	91,21,800	Payment of dividend (assumed to be paid)	58,52,100
		Net Increase in Working Capital	30,88,700
	97,04,800		97,04,800

Working Notes :

(1) *Calculation of Sale of Plant :*

	Rs.
Net book value of plant sold	4,32,100
Less : Loss on sale of plant	1,33,400
	2,98,700

(2) *Calculation of Funds from Operations :*

	Rs.
Net Income after Income tax (given)	83,26,600
Add : Depreciation being non-fund	7,95,200
	91,21,800

(3) Purchase of plant of Rs. 23,19,000 against issue of notes due in 1998 has neither been shown as a source of funds nor applications because both the accounts involved are non-current.

Problem 3.38 Prepare Funds Fow Statement from the following information :

	Jan. 1 1994	*Dec. 31, 1994*
	Rs.	*Rs.*
Reserves and Surplus	40,000	60,000
Machinery	50,000	1,50,000
Accumulated Depreciation	25,000	20,000
Discount on Issue of Debentures	—	5,000

A machine costing Rs. 50,000 (accumulated depreciation Rs. 15,000) was sold for Rs. 10,000 on January, 1, 1994. There was an issue of Rs. 1,00,000 debentures at a discount of 5% for the purchase of a machine. Rs. 10,000 was paid as dividend during the year.

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Solution :

FUNDS FLOW STATEMENT

Sources	*Amount*	*Applications*	*Amount*
Sale of Machinery	10,000	Dividend paid	10,000
Funds from Operations (3)	50,000	Purchase of Machinery	55,000
Net Decrease in W.C.	5,000		
	65,000		65,000

Working Notes :

(1) **MACHINERY ACCOUNT**

		Rs.		*Rs.*
To Balance b/d		50,000	By Cash (Sale)	10,000
To Debentures	1,00,000		By Accumulated Depreciation	15,000
Less : Discount (purchased)	5,000		By Loss on sale	25,000
		95,000	By Balance c/d	1,50,000
To Cash (balancing figure)		55,000		
		2,00,000		2,00,000

(2) Purchase of machinery for Rs. 95,000 against issue of Rs. 1,00,000 debentures at 5% discount has not been shown as an application. Accordingly, the issue of debentures has not been taken as a source of funds (both are non-current accounts).

(3) **ADJUSTED PROFIT AND LOSS ACCOUNT**

(Reserve & Surplus Account)

	Rs.		*Rs.*
To Loss on sale of machinery	10,000	By Balance b/d	40,000
		By Funds from Operations (balancing figure)	50,000
To Dividend	10,000		
To Accumulated Depreciation	10,000		
To Balance c/d	60,000		
	90,000		90,000

(4) **ACCUMULATED DEPRECIATION ACCOUNT**

	Rs.		*Rs.*
To Machinery A/c (Dep. on machine sold)	15,000	By Balance b/d	25,000
		By P/L Account (Reserve & Surplus)	10,000
To Balance c/d	20,000		
	35,000		35,000

(5) Because the balance sheet data are incomplete, schedule of changes in working capital cannot be prepared.

Problem 3.39 The non-current assets and equities of a Limited Company are given at the begining and at the end of the year 1993.

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	Dec. 31 1993 Rs.	*Jan. 1, 1993 Rs.*		*Dec. 31, 1993 Rs.*	*Jan. 1, 1993 Rs.*
Plant Assets, net of depreciation	3,00,000	1,40,000	Debentures	15,00,000	6,00,000
Investments in shares of XYZ Ltd.	6,00,000	2,75,000	Capital Stock	7,00,000	7,00,000
			Retained Earnings	8,25,000	4,80,000

You are unable to obtain complete balance sheet data or an income statement for the year, but you have obtained the following information :

(i) A gain of Rs. 25,000 on sale of equipment has been included in net income. The gross plant assets increased by Rs. 2,00,000 though equipment costing Rs. 65,000 with a net book value of Rs. 40,000 was sold.

(ii) Dividends of Rs. 80,000 were paid.

Prepare a statement of sources and uses of net working capital from the information mentioned above.

Solution :

STATEMENT OF SOURCES AND NET USES OF WORKING CAPITAL

(for the year ended 31st December, 1993)

Sources	*Rs.*	*Applications*	*Rs.*
Issue of Debentures[1]	9,00,000	Purchase of Plant[2]	2,65,000
Sale of Equipment		Purchase of Investments[2]	3,25,000
(40,000 + 25,000)	65,000	Dividend paid	80,000
Funds from Operations[4]	4,65,000	Net Increase in W.C. (balancing figure)	7,60,000
	14,30,000		14,30,000

Working Notes :

(1) **DEBENTURES ACCOUNT**

	Rs.		*Rs.*
To Balance c/d	15,00,000	By Balance b/d	6,00,000
		By Cash, Issue (balancing figure)	9,00,000
	15,00,000		15,00,000

(2) **PLANT ASSETS ACCOUNT**

	Rs.		*Rs.*
To Balance b/d	1,40,000	By Cash-Sale (40,000 + 25,000)	65,000
To Adjusted Retained Earnings Account (Profit on sale)	25,000	By Depreciation (balancing figure)	65,000
To Cash purchase (2,00,000 + 65,000)	2,65,000	By Balance c/d	3,00,000
	4,30,000		4,30,000

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(3) **INVESTMENTS ACCOUNT**

	Rs.		*Rs.*
To Balance b/d	2,75,000	By Balance c/d	6,00,000
To Cash-purchased (balancing figure)	3,25,000		
	6,00,000		6,00,000

(4) **ADJUSTED RETAINED EARNINGS ACCOUNT**

	Rs.		*Rs.*
To Dividends	80,000	By Balance b/d	4,80,000
To Depreciation	65,000	By Plant Assets (profit on sale)	25,000
To Balance c/d	8,25,000	By Funds from Operations	4,65,000
	9,70,000		9,70,000

(5) Because the balance sheet data are incomplete, schedule of changes in Working Capital cannot be prepared.

Problem 3.40 From the following financial statements and additional data condensed from reports of XYZ Ltd., prepare a Fund Flow Statement for the year ended 31st December, 1994 :

PROFIT AND LOSS ACCOUNT

(for the year ended 31st December)

		1993		*1994*	
		(Rs. '000)		*(Rs.* '000)	
	Sales		500		700
Less :	Cost of sales : Stock (opening)	125		60	
	Purchases	425		400	
		550		460	
Less :	Stock (closing)	60	490	80	380
			10		320
Less :	Opening Expenses		140		160
			(130)		160
	Balance of Undistributed Profit b/f		90		(40)
	Balance available for distribution		(40)		120
Less :	Dividend Paid		—		100
	Balance of Undistributed Profit c/f		(40)		20

BALANCE SHEETS

(as at 31st December)

Liabilities	*1993* Rs. '000	*1994* Rs. '000	*Assets*	*1993* Rs. '000	*1994* Rs. '000
Expenses Payable	25	20	Cash	40	50
Sundry Creditors	75	130	Prepaid Expenses	5	10
Long-term Loans	200	100	Sundry Debtors	4	10
Paid-up Capital	100	200	Stock	60	80
P and L A/c	—	20	Investments (Short-term)	50	120
			Fixed Assets	200	200
			P. and L. Account	40	—
	400	470		400	470

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Additional Information :

(a) Depreciation charges for 1994 – Rs. 20,000.

(b) There are no sales of fixed assets during the period.

Solution :

SCHEDULE OF CHANGES IN WORKING CAPITAL

(Rs. '000)

	1993	*1994*	*Increase in W.C.*	*Decrease in W.C.*
Current Assets :				
Cash	40	50	10	—
Prepaid Expenses	5	10	5	—
Sundry Debtors	5	10	5	—
Stock	60	80	20	—
Investments	50	120	70	—
	160	270		
Current Liabilities				
Expenses Payable	25	20	5	—
Sundry Creditors	75	130	—	55
	100	150		
Working Capital (C.A.–C.L.)	60	120		
Net Increase in W.C.	60			60
	120	120	115	115

FUNDS FLOW STATEMENT

Sources	*Rs. '000*	*Applications*	*Rs. '000*
Raising of Capital		Purchase of Fixed Assets	20
(200–100)	100	Repayment of Long-term	
Funds from Operations	180	Loans (200–100)	100
		Payment of Dividend	100
		Net Increase in W.C.	60
	280		280

Working Notes :

(1) **FIXED ASSETS ACCOUNT**

	Rs. '000		*Rs. '000*
To Balance b/d	200	By Depreciation	20
To Cash–Purchased (balancing figure)	20	By Balance c/d	200
	220		220

(2) **FUNDS FROM OPERATIONS**

	Rs. '000	
Trading Profit (1994)	160	(given)
Add : Non-fund items charged to P/L A/c :		
Depreciation	20	
Funds from Operations	180	

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OR

ADJUSTED PROFIT AND LOSS ACCOUNT

	Rs. '000		*Rs. '000*
To Balance b/d	40	By Funds from Operations	180
To Dividend Paid	100		
To Depreciation	20		
To Balance c/d	20		
	180		180

Problem 3.41 The following information is extracted from the annual reports of Recurd Ltd., for the year ended 31st December :

Revenue Statement

	1993 (Rs.)	1994 (Rs.)
Sales	1,80,00,000	1,65,00,000
Less : Cost of Sales	1,35,00,000	1,26,40,000
Gross Profit	45,00,000	39,60,000
Operating Expenses :		
Selling	21,60,000	13,20,000
Administration	11,40,000	12,15,000
	33,00,000	25,35,000
Net operating Income	12,00,000	14,25,000
Interest Received	75,000	30,000
	12,75,000	14,55,000
Less : Loss on Sale of Investments	—	2,55,000
Net Profit for the year	12,75,000	12,00,000
Less : dividend paid	6,75,000	4,50,000
	6,00,000	7,50,000
Balance of Unappropriated Profit brought forward	29,85,000	35,85,000
Balance of Unappropriated Profit carried forward	35,85,000	43,35,000

Balance Sheet as at 31st December

Paid-up Capital	45,00,000	45,00,000
Profit and Loss Account	35,85,000	43,35,000
Creditors	9,00,000	10,50,000
Bills Payable	4,50,000	5,25,000
	94,35,000	1,04,10,000
Plant at Cost (1st January)	60,00,000	61,50,000

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Additions	1,50,000	15,75,000
	61,50,000	77,25,000
Less : Provision for Depreciation	17,25,000	23,40,000
	44,25,000	53,85,000
Investments	9,60,000	3,00,000
Stock	7,50,000	15,00,000
Bills Receivable	3,75,000	10,05,000
Sundry Debtors	15,00,000	20,55,000
Cash at Bank	14,25,000	1,65,000
	94,35,000	1,04,10,000

Additional Information :

(a) It was proposed to sell the remaining investments in early 1995.

(b) There were no sales of plant in 1993 and 1994.

Required. A statement of sources and applications of funds for the year ended 31st December 1994.

Solution :

STATEMENT OF CHANGES IN WORKING CAPITAL

	1993	*1994*	*Increase in W.C.*	*Decrease in W.C.*
Current Assets :	*Rs.*	*Rs.*	*Rs.*	*Rs.*
Stock	7,50,000	15,00,000	7,50,000	—
Bills Receivable	3,75,000	10,05,000	6,30,000	—
Sundry Debtors	15,00,000	20,55,000	5,55,000	—
Cash at Bank	14,25,000	1,65,000	—	12,60,000
	40,50,000	47,25,000		
Current Liabilities :				
Creditors	9,00,000	10,50,000		1,50,000
Bills Payable	4,50,000	5,25,000		75,000
	13,50,000	15,75,000		
Working Capital (C.A–C.L.)	27,00,000	31,50,000		
Net Increase in W.C.	4,50,000			4,50,000
	31,50,000	31,50,000	19,35,000	19,35,000

STATEMENT OF SOURCES AND APPLICATIONS OF FUNDS

For the year ended 31st December, 1994

Sources	*Rs.*	*Applications*	*Rs.*
Sales of Investments (1)	4,05,000	Payment of Dividend	4,50,000
Interest Received	30,000	Purchase of Plant	15,75,000
Funds from Operations (2)	20,40,000	Net Increase in W.C.	4,50,000
	24,75,000		24,75,000

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Working Notes :

(1) **INVESTMENT ACCOUNT**

	Rs.		*Rs.*
To Balance b/d	9,6 0,000	By Cash-Sale (balancing figure)	4,05,000
		By Adjusted P/L A/c (Loss on sale)	2,55,000
		By Balance c/d	3,00,000
	9,60,000		9,60,000

Note : Investments have been considered as long-term investments

ADJUSTED PROFIT AND LOSS ACCOUNT

Adjusted Profit and Loss Account

	Rs.		*Rs.*
To Loss on sale of investments	2,55,000	By Balance b/d	35,85,000
To Dividend paid	4,50,000	By Interest Received	30,000
To Provision for Depreciation (23,40,000–17,25,000)	6,15,000	By Funds from Operations (balancing figure)	20,40,000
To Balance c/d	43,35,000		
	56,55,000		56,55,000

Problem 3.42 The Summarised Profit and Loss Account for the year ended 31st December, 1989 and 31st December, 1990 and the Balance Sheets of B. Ltd. as on those dates are given below :

	1989		1990
	Rs.		*Rs.*
Trading Profit	90,000		1,40,000
Profit on Sale of Investments	—		4,000
	90,000		1,44,000
Taxation Provision	55,400		90,000
	34,600		54,000
Brought forward from previous year	30,000		34,600
Income-tax over provided in previous year	—		8,000
	64,600		96,600
Proposed Dividend	30,000	30,000	
Transfer to General Reserve	—	20,000	50,000
Balance of undistributed profit	34,600		46,000

Balance Sheets

		1989		1990
	Rs.	*Rs.*	*Rs.*	*Rs.*
Fixed Assets :			1,20,000	
Cost	1,00,000			
Additions During the year	20,000	1,20,000	16,000	1,36,000
		40,000		64,000
Depreciation		80,000		72,000

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Current Assets :				
Investments	24,000		—	
Debtors	2,60,000		4,37,000	
Stock	3,56,000		4,00,000	
	6,40,000		8,37,000	
Current Liabilities :				
Trade Creditors	1,40,000		1,80,000	
Bank overdraft	2,30,000		2,80,000	
Creditors for expenses	16,000		18,400	
Current Taxation	39,400		60,000	
Proposed Dividend	30,000		30,000	
	4,55,400		5,68,400	
Net Current Assets		1,84,600		2,68,600
Total		2,64,600		3,40,600
Equity Share Capital		1,40,000		1,60,000
General Reserve		50,000		70,000
Profit and Loss A/c		34,600		46,600
Future Taxation		40,000		64,000
		2,64,600		3,40,600

For the year ended 31st December, 1990 the trading profit was arrived at after charging depreciation Rs. 24,000.

You are required to prepare a statement showing :

(a) Changes in working ; and

(b) Sources of funds and their applications.

Solution :

STATEMENT SHOWING CHANGES IN WORKING CAPITAL

	1989	*1990*	*Increase in W.C.*	*Decrease in W.C.*
	Rs.	*Rs.*	*Rs.*	*Rs.*
Current Assets :				
Investments	24,000	—	—	24,000
Debtors	2,60,000	4,37,000	1,77,000	—
Stock	3,56,000	4,00,000	44,000	—
	6,40,000	8,37,000		
Current Liabilities :				
Trade Creditors	1,40,000	1,80,000	—	40,000
Creditors for expenses	16,000	18,400	—	2,400
Current Taxation	39,400	60,000	—	20,600
Bank overdraft	2,30,000	2,80,000	—	50,000
Proposed Dividend	30,000	30,000	—	—
	4,55,400	5,68,400		
Working Capital (C.A.–C.L.)	1,84,600	2,68,600		
Net Increase in W.C.	84,000			84,000
	2,68,600	2,68,600	2,21,000	2,21,000

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FUNDS FLOW STATEMENT

Sources	*Rs.*	*Applications*	*Rs.*
Issue of Shares[1]	20,000	Purchase of Fixed Assets[2]	16,000
Funds from Operations[6]	1,38,000	Payment of Tax	58,000
		Net Increase in W.C.	84,000
	1,58,000		1,58,000

Working Notes :

(1) **EQUITY SHARE CAPITAL ACCOUNT**

	Rs.		*Rs.*
		By Balance b/d	1,40,000
		By Cash	20,000
To Balance c/d	1,60,000	(balancing figure)	
	1,60,000		1,60,000

(2) **FIXED ASSETS ACCOUNT**

	Rs.		*Rs.*
To Balance b/d	1,20,000		
To Cash (Purchases)	16,000	By Balance c/d	1,36,000
(balancing figure)			
	1,36,000		1,36,000

(3) **FUTURE TAXATION ACCOUNT**

	Rs.		*Rs.*
To P/L A/c	8,000	By Balance b/d	40,000
(Income-tax over		By P/L A/c (Adjusted)	
provided in previous		(Provision created	
year transferred)		during the year, given)	90,000
To Cash-paid (balancing figure)	58,000		
To Balance c/d	64,000		
	1,30,000		1,30,000

(4) **GENERAL RESERVE ACCOUNT**

	Rs.		*Rs.*
		By Balance b/d	50,000
To Balance c/d	70,000	By Adjusted P/L A/c	
		(balancing figure)	20,000
	70,000		70,000

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(5) **ACCUMULATED DEPRECIATION ACCOUNT**

	Rs.		Rs.
To Balance c/d	64,000	By Balance b/d	40,000
		By Adjusted P/L A/c (balancing figure)	24,000
	64,000		64,000

(6) **ADJUSTED PROFIT AND LOSS ACCOUNT**

	Rs.		Rs.
To Depreciation A/c	24,000	By Balance b/d	34,600
To General Reserve	20,000	By Future Taxation A/c	8,000
To Future Taxation A/c	90,000	By Funds from Operations (balancing figure)	1,38,000
To Balance c/d	46,600		
	1,80,600		1,80,600

Problem 3.42 The chairman of XYZ Ltd. has reviewed 1989 draft accounts and is unable to determine the reasons for the changes in working capital during the year. He requests your assistance. In addition to the accounts summary given below, you obtain the following information concerning 1989 transactions :

(i) An old machine costing Rs. 5,400 was scrapped and written off. The cost of dismantling and disposal were equal to the proceeds received. Accumulated depreciation on this machine was Rs. 3,960.

(ii) During November 1989, additional shares were issued at par.

(iii) An interim dividend of $3^1/_2\%$ was paid on 30th May, 1989.

(iv) There was no purchase or sale of tools during the year. A small piece of land was sold for Rs. 12,000.

(v) A provision of Rs. 10,000 in respect of taxation on the profits of the year was included in General Expenses.

Summarised Balance Sheets as on 31st December :

	1989	1988
	Rs.	Rs.
Assets :		
Land	1,68,000	1,80,000
Building	9,72,000	6,72,000
Machinery	3,96,000	2,40,000
Tools	48,000	84,000
Shares in Associated Company	21,600	18,000
Stock	2,52,000	2,61,600
Insurance prepaid	1,440	1,680
Debtors	2,41,200	1,42,800
Balance at Bank	11,620	10,800
Discount on Debentures	2,520	3,000
Goodwill	—	2,40,000
	21,14,380	18,53,880

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Liabilities:		
Issued Share Capital	8,40,000	4,80,000
Unappropriated Profits	7,02,340	9,40,560
Provision for Depreciation	3,25,440	2,17,200
Debentures	1,80,000	1,20,000
Current Liabilities :		
Bank overdraft	11,400	8,160
Trade Creditors	31,400	74,400
Accrued Interest	12,000	7,200
Provision for Doubtful Debts	5,400	2,760
Taxation Provision	6,400	3,600
	21,14,380	18,53,880

Summarised Trading and Profit and Loss Account (for the year ended 31st December, 1989).

		Rs.
Sales less returns		15,55,000
Factory Expenses :		
Factories and supplies	4,70,000	
Direct labour	1,37,000	
Factory overhead	2,17,800	
Depreciation–		
Building, Machinery, Tools	1,48,200	
	9,73,000	
Selling Expenses	3,54,000	
General Expenses	1,98,500	
Interest on debentures	9,000	15,34,500
Net Profit		20,500

You are required to prepare a statement of source and Application of Funds for the year ended 31st December, 1989 showing changes in working capital.

(A.C.S. Final)

Solution :

SCHEDULE OF CHANGES IN WORKING CAPITAL

	1988	*1989*	*Increase in W.C.*	*Decrease in W.C.*
Current Assets :	*Rs.*	*Rs.*	*Rs.*	*Rs.*
Stock	2,61,600	2,52,000	—	9,600
Debtors less provision	1,40,040	2,35,800	95,750	—
Prepaid Insurance	1,680	1,440	—	240
Balance at Bank	10,800	11,620	820	—
	4,14,120	5,00,860		

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Current Liabilities :				
Bank overdraft	8,160	11,400	—	3,240
Trade Creditors	74,400	31,400	43,000	—
Accrued Interest	7,200	12,000	—	4,800
Taxation Provision	3,600	6,400	—	2,800
	93,360	61,200		
Working Capital (C.A.–C.L.)	3,20,760	4,39,660		
Net Increase in W.C.	1,18,900	—		1,18,900
	4,39,660	4,39,660	1,39,580	1,39,580

STATEMENT OF SOURCES AND APPLICATIONS OF FUNDS

Sources	*Rs.*	*Applications*	*Rs.*
Sale of Land	12,000	Additions to Building (9,72,000–6,72,000)	3,00,000
Issue of Shares (8,40,000–4,80,000)	3,60,000	Purchase of Machinery	1,61,400
Issue of Debentures (1,80,000–1,20,000)	60,000	Acquisition of Shares in Associated Company (21,600–18,000)	3,600
Funds from Operations (4)	1,68,700	Payment of Interim Dividend	16,800
		Net Increase in W.C.	1,18,900
	6,00,700		6,00,700

Working Notes :

(1) **MACHINERY ACCOUNT**

	Rs.		*Rs.*
To Balance b/d	2,40,000	By Provision for Dep. A/c	3,960
To Purchases (balancing figure)	1,61,400	By P/L A/c (machinery scrapped)	1,440
		By Balance c/d	3,96,000
	4,01,400		4,01,400

(2) **TOOLS ACCOUNT**

	Rs.		*Rs.*
To Balance b/d	84,000	By Provision for Depreciation A/c	36,000
		By Balance c/d	48,000
	84,000		84,000

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(3) **PROVISION FOR DEPRECIATION ACCOUNT**

	Rs.		Rs.
To Machinery Account	3,960	By Balance b/d	2,17,200
To Tools Account	36,000	By P/L Account	
To Balance c/d	3,25,440	(Depreciation charged)	1,48,200
	3,65,400		3,65,400

(4) **ADJUSTED PROFIT AND LOSS ACCOUNT**

	Rs.		Rs.
To Goodwill written off	2,40,000	By Balance b/d	9,40,560
To Discount on Debentures		By Funds from Operations	1,68,700
written off (3,000–2,520)	480		
To Machinery (scrapped)	1,440		
To Depreciation	1,48,200		
To Interim Dividend			
(3½% on 4,80,000)	16,800		
To Balance c/d	7,02,340		
	11,09,260		11,09,260

Alternatively

	Rs.
Funds From Operations :	
Net Profit (as given)	20,500
Add : Depreciation	1,48,200
	1,68,700

Problem 3.44 A Company finds on 1st January, 1986 that it is short of funds with which to implement its programme of expansion. On 1st January, 1985, it had a bank balance of Rs. 1,80,000 while on 31st December, 1985, it has an overdraft of Rs. 68,750. From the following informtion, prepare a statement of sources and uses of net working capital (Funds Flow Statement) :

Figure as per Balance Sheets as at 31st December of each year are as follows :

	1984	1985
	Rs.	Rs.
Fixed Assets (Gross)	7,50,000	11,20,000
Stock and Stores	1,90,000	3,30,000
Debtors	3,80,000	3,35,000
Bank Balance	1,80,000	68,750
Trade Creditors	2,70,000	3,50,000
Share Capital		
(in shares of Rs. 10 each)	2,50,000	3,00,000
Bills Receivable	87,500	95,000

The profit for the year ended 31st December, 1985 before charging depreciation and taxation amounted to Rs. 2,40,000.

The 5,000 shares were issued on 1st January, 1985 at a premium of Rs. 5 per Share.

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Rs. 1,37,500 were paid in March 1985 by way of income tax. Dividend was paid as follows :

1984 (final) on the capital on 31.12.1984 at 10%, Less tax at 25%

1985 (interim) 5% free of tax.

Solution :

SCHEDULE OF CHANGES IN WORKING CAPITAL

	1984	*1985*	*Increase in W.C.*	*Decrease in W.C.*
Current Assets :	*Rs.*	*Rs.*	*Rs.*	*Rs.*
Stock and Stores	1,90,000	3,30,000	1,40,000	—
Debtors	3,80,000	3,35,000	—	45,000
Bank Balance	1,80,000	—		1,80,000
Bills Receivable	87,500	95,000	7,500	
	8,37,500	7,60,000		
Current Liabilities :				
Trade Creditors	2,70,000	3,50,000	—	80,000
Bank Overdraft	—	68,750	—	68,750
	2,70,000	4,18,750		
Working Capital (C.A.–C.L.)	5,67,500	3,41,250		
Net Decrease in W.C.	—	2,26,250	2,26,250	
	5,67,500	5,67,500	3,73,750	3,73,750

FUNDS FLOW STATEMENT

Sources	*Rs.*	*Applications*	*Rs.*
Issue of Share Capital	50,000	Purchase of Fixed Assets	
Share Premium	25,000	(11,20,000–7,50,000)	3,70,000
Funds from Operations	2,40,000	Payment of Dividends :	
Net Decrease in W.C.	2,26,250	for 1984 (final)	18,750
		for 1985 (interim)	15,000
		Payment of Income-tax	1,37,500
	5,41,250		5,41,250

Working Notes :

(1) In the absence of any other information about non-operating expenses/ incomes etc., Rs. 2,40,000 profit before charging depreciation and taxation, as given, has been taken as funds from operations.

(2) It has been assumed that Rs. 1,37,500 of income tax paid includes income-tax deducted at source of final dividend of 1984 and interim dividend of 1985.

(3) Payment of dividend is calculated as follows :

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(a) For 1984 (final)10% on 2,50,000	= 25,000
Less : Tax deducted @ 25%	6,250
	18,750
(b) For 1985 (interim) 5% on 3,00,000 (free of tax)	15,000

Problem 3.45 The following are the summarised trial balances of ABC Ltd. as at 31st March 1993 and 31st March 1994.

	1993		1994	
	Dr. Rs.	*Cr.* Rs.	*Dr.* Rs.	*Cr.* Rs.
Fixed Assets	23,36,960		24,60,500	
Current Assets	9,60,540		7,91,800	
Debenture Discount	30,000		25,000	
Issued Capital				
Equity		15,00,000		15,00,000
Preference		3,00,000		40,00,000
Share premium A/c		30,000		40,000
Debentures		5,00,000		5,00,000
Current Liabilities		6,20,000		4,40,000
Provision for Dep.		1,80,000		1,95,000
Provision for D/D		6,000		5,000
Dividend			1,50,000	
Balance of P and L Account from Previous Year		24,400		1,19,500
Net Profit for the year		1,67,100		1,55,800
	33,27,500	33,27,500	34,27,300	34,27,300

(a) During the year ended 31st March, 1994 machinery costing Rs. 2,00,000 (accumulated provisions for depreciation Rs. 60,000) was sold for Rs. 150,000.

(b) Rs. 1,00,000 preference share capital was issued during 1993-1994 at a premium of Rs. 10,000.

(c) The net profit for 1993-94 was arrived at after taking credit for the profit on sale of machinery, reduction in the provision for doubtful debts and writing off the discount on issue of debentures.

You are required to prepare :

(i) A statement showing the net increase in working capital during the year 1993-94 ; and

(ii) A statement showing the sources of the funds and application thereof during the year.

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Solution :

STATEMENT SHOWING THE NET INCREASE IN WORKING CAPITAL

	31.3.1993	*31.3.1994*	*Increase in in W.C.*	*Decrease in W.C.*
	Rs.	*Rs.*	*Rs.*	*Rs*
Current Assets	9,60,540	7,19,800	—	1,68,740
Current Liabilities	6,20,000	4,40,000	1,80,000	
Working Capital (C.A.–C.L.)	3,40,540	3,51,800		
Net Increase in W.C.	11,260			11,260
	3,51,800	3,51,800	1,80,000	1,80,000

FUNDS FLOW STATEMENT

Sources	*Rs.*	*Applications*	*Rs.*
		Purchase of Fixed Assets (1)	3,23,540
Issue of Preference Shares (4,00,000–3,00,000)	1,00,000	Payment of Dividend	1,50,000
		Net Increase in W.C.	11,260
Share Premium (40,000–30,000)	10,000		
Sale of Machinery	1,50,000		
Funds from Operations (3)	2,24,800		
	4,84,800		4,84,800

Working Notes :

(1) **FIXED ASSETS ACCOUNT**

	Rs.		*Rs.*
To Balance b/d	23,36,960	By Cash (Sold)	1,50,000
To Adjusted P/L A/c (Profit on Sale)	10,000	BNy Provision for Depreciation	60,000
To Cash-Purchased (balancing figure)	3,23,540	By Balance c/d	24,60,500
	26,70,500		26,70,500

(2) **PROVISION FOR DEPRECIATION ACCOUNT**

	Rs.		*Rs.*
To Fixed Assets A/c	60,000	By Balance b/d	1,80,000
To Balance c/d	1,95,000	By Adjusted P/l A/c (balancing figure)	75,000
	2,55,000		2,55,000

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(3) **ADJUSTED PROFIT AND LOSS ACCOUNT**

	Rs.		Rs.
To Provision for Dep A/c	75,000	By Fixed Assets A/c (Profit on sale)	10,000
To Debenture Discount (30,000–25,000)	5,000	By Provision for doubtful debts (6,000–5,000) (Decrease in provision)	1,000
To Balance c/d (Profit for the year)	1,55,800	By Funds from Operations	2,24,800
	2,35,800		2,35,800

Problem 3.46 The following are the Balance Sheets of Bharat Industries Ltd., as at 31st December, 1989 :

	31st December 1988	31st December 1989
Buildings and Machinery	1,72,778	2,07,782
Investments	1,17,500	90,000
Sundry Debtors	67,186	65,638
Stock in trade	83,164	95,438
Advances	9,025	9,816
Cash & Bank Balances	40,409	30,337
Debenture Discount	4,305	2,867
	4,64,367	5,01,878
Share Capital (Face Value Rs. 100 each)	1,00,000	92,500
Reserves & Surplus	80,231	80,753
Reserve for contingencies	37,500	63,600
Allowance for inventory Loss	2,000	8,500
Accumulated Depreciation	96,618	81,633
Allowance for Loss on Sundry Debtors	4,630	3,815
6% Mortgage Debentures	82,000	68,500
Accrued Interest, Taxes, etc.	12,307	21,263
Sundry Creditors	79,081	81,314
	4,94,367	5,01,878

The following information concerning transactions is available :

(1) Net Profit for 1989 was Rs. 48,097 as per P/L A/c.

(2) The share Capital Account as at 31.12.1988 includes 75 Redeemable Preference Shares. These were redeemed during the year at Rs. 111 per share. Subsequent to redemption, a cash dividend of 10% was paid.

(3) Machinery was Purchased for Rs. 31,365 and machinery costing. Rs. 32,625 was scrapped. The scrapped machinery had accumulated depreciation of Rs. 29,105 at the date of scrap. The scrap was sold for Rs. 1,000 which was credited against the Profit & Loss Account on scrapping of the asset. The remaining increase in fixed assets resulted from construction of a building.

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(4) The debentures mature at the rate of Rs. 5,000 per year. In addition to the redemption of Rs. 5,000 debentures due in 1989, the company purchased and redeemed Rs. 8,500 of the debentures at Rs. 103. Both the premium on redemption and applicable discount were charged as expenses.

(5) The allowance for inventory was created by a charge to expense in each year. It was set up to reduce the divisible profits.

(6) A sum of Rs. 11,400 was debited to Reserve for Contingency Account during the year. It represented the amount of Income Tax Liability of previous year in dispute ; being paid.

You are required to prepare a statement showing the Sources and Applications of Funds for the year 1989. *(C.A. Final)*

Solution :

SCHEDULE OF CHANGES IN WORKING CAPITAL

	1988	*1989*	*Increase in W.C.*	*Decrease in W.C.*
	Rs.	*Rs.*	*Rs.*	*Rs*
Current Assets :				
Sundry Debtors	67,186	65,638	—	1,548
Stock-in-trade	83,164	95,438	12,274	
Advances	9,025	9,816	791	—
Cash and Bank Balances	40,409	30,337	—	10,072
	1,99,784	2,01,229		
Current Liabilities :				
Accrued Interest, taxes, etc.	12,307	21,263	—	8,956
Sundry Creditors	79,081	81,314	—	2,233
	91,388	1,02,577		
Working Capital (C.A.–C.l.)	1,08,396	98,652		
Net Decrease in W.C.		9,744	9,744	
	1,08,396	1,08,396	22,809	22,809

Notes :

(i) Allowance for loss on sundry debtors is presumed to have been written back during the year by Rs. 815 (4630-3815) and hence not shown in schedule of changes in working capital. It will appear in Adjusted Profit and Loss Account. Otherwise it could be deducted out of sundry debtors or shown as a current liability also. But in that case it will not be considered in Adjusted Profit and Loss Account.

(ii) Allowance for inventory loss being set up to reduce divisible profits has been treated as an appropriation of profits.

(iii) Investments have been taken as long term investments.

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STATEMENT OF SOURCES AND APPLICATION OF FUNDS

Sources	*Rs.*	*Applications*	*Rs.*
Sale of Machinery as scrap	1,000	Redemption of preference	
Sale of Investments	27,500	shares (75 × 111)	8,325
Funds from Operations	72,115	Redemption of debentures	
Net Decrease in Working Capital	9,744	(5,000 + 85 × 103)	13,755
		Purchase of machinery	31,365
		Payment of dividend	9,250
		Construction of building	36,264
		Payment of tax	11,400
	1,10,359		1,10,359

Working Notes :

(1) SHARE CAPITAL ACCOUNT (EQUITY + PREFERENCE)

	Rs.		*Rs.*
To Cash (redemption)	8,325	By Balance b/d	1,00,000
To Balance c/d	92,500	By Adjusted P/L A/c (Premium on Redemption)	825
	1,00,825		1,00,825

(2) 6% MORTGAGE DEBENTURES ACCOUNT

	Rs.		*Rs.*
To Cash (redeemed)	5,000	By Balance b/d	82,000
To Cash (85 × 103)	8,755	By Adjusted P/L A/c	
To Balance c/d	68,500	(Premium on Redemption of Debentures)	255
	82,255		82,255

(3) BUILDING AND MACHINERY ACCOUNT

	Rs.		*Rs.*
To Balance b/d	1,72,778	By Depreciation	29,105
To Machinery-purchased	31,365	By Sale of machinery	1,000
To Cash-construction of building		By Loss on sale (adjusted P/L A/c)	2,520
(balancing figure)	36,264	By Balance c/d	2,07,782
	2,40,407		2,40,407

(4) INVESTMENTS ACCOUNT

	Rs.		*Rs.*
To balance b/d	1,17,500	By Cash (investment sold) (balancing figure)	27,500
		By Balance c/d	90,000
	1,17,500		1,17,500

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(5) DEBENTURE DISCOUNT ACCOUNT

	Rs.		Rs.
To Balance b/d	4,305	By Adjusted P/L A/c (balancing figure)	1,438
		By Balance c/d	2,867
	4,305		4,305

(6) ALLOWANCE FOR LOSS ON DEBTORS

	Rs.		Rs.
To Adjusted P/L A/c (written off) (balancing figure)	815	By Balance b/d	4,630
To Balance c/d	3,815		
	4,630		4,630

(7) RESERVE FOR CONTINGENCIES ACCOUNT

	Rs.		Rs.
To Cash (Taxes paid)	11,400	By Balance b/d	37,500
To Balance c/d	63,600	By Adjusted P/L A/c (balancing figure)	37,500
	75,000		75,000

(8) ADJUSTED PROFIT AND LOSS ACCOUNT

	Rs.		Rs.
To Premium on Redemption of Preference shares	825	By Balance b/d	80,231
To Debentures	255	By Allowance for Loss on debtors	815
To Depreciation (9)	14,120	By Funds from Operations (balancing figure)	72,115
To Loss on Sale of machinery	2,520		
To Debenture Discount	1,438		
To Allowance for Inventory Loss	6,500		
To Reserve for contingencies	37,500		
To Dividend (10% on 92,500)	9,250		
To Balance c/d	80,753		
	1,53,161		1,53,161

(9) ACCUMULATED DEPRECIATION ACCOUNT

	Rs.		Rs.
To Depreciation on machinery scrapped	29,105	By Balance b/d	96,618
To Balance c/d	81,633	By Adjusted P/L A/c (balancing figure)	14,120
	1,10,738		1,19,738

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Problem 3.47 The following is the audited Balance Sheet of Shri Ram Chandra as on 31st March, 1993 :

Liabilities	*Rs.*	*Assets*	*Rs.*
Capital Account	1,62,000	Machineries	40,000
Sundry creditors for goods	30,000	Furniture	10,000
		Stock	35,000
		Debtors	90,000
		Cash in hand	6,000
		Cash at Bank	11,000
	1,92,000		1,92,000

A fire occurred in the evening of 31st March, 1994 destroying the books of accounts and records. The cashier absconded with the available cash in the Cash Box.

The trader gives the following information :

(1) Sales are effected as 20% for cash and the balance on credit. His total sales for the year ended March 31, 1994, were 20% higher than the previous year. All sales and purchases of goods were evenly spread throughout the year (as also in the last year).

(2) Terms of Credit { Debtors 2 months; Creditors 1 month }

(3) Stock level was maintained at Rs. 35,000 all through the year.

(4) A steady gross profit rate of $33^1/_3$ on turnover was maintained throughout. Creditors are paid by cheque only. There is no cash psurchase.

(5) His private records and the Bank Pass Book kept with him disclosed the following transactions for the year :

(i) Miscellaneous business expenses..... Rs. 1,80,000 (of which Rs. 5,000 was outstanding as on March 31, 1994)

(ii) Repairs ..... Rs. 2,500 (including Rs. 35,000 paid by cheque) (Paid By Cash)

(iii) Additions to machineries... Rs. 50,000 (Paid by cheque)

(iv) Private drawings..... Rs. 36,000 (Paid by cash)

(v) Travelling expenses... Rs. 12,000 (Paid by cash)

(6) Collections from debtors (including Rs. 30,000 for cash) and payments to creditors were prompt all along.

(7) Depreciation was to be provided on machinery @ 10% of the closing book value.

(8) The Cash stolen is to be charged to the Profit and Loss Account.

Prepare a statement of source and application of funds for the year ended 31st March 1994. *[C.A. Final (New)]*

Solution :

1. *Calculation of Sales for the year 1993-94*

Debtors = 2 months' sales.

= Rs. 90,000 (given)

Hence, Credit Sales (1992-93) $= 90,000 \times \frac{12}{2}$ — *Rs.* 5,40,000

Cash Sales (1992-93) — 1,35,000

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(As 20% of total sales are made for cash,
so ratio of credit sales to cash sales = 4 : 1)

Total Sales for 1992-93	6,75,000
Add 20% (Increase in sales during 1993-94)	1,35,000
Total sales for 1993-94	8,10,000
Cash sales (20%)	1,62,000
Credit Sales	6,48,000

(2) *Calculation of Purchases for the year 1993-94 :*

	Rs.
Sales	8,10,000
Less : Gross Profit $33^1/_3$%	2,70,000
Cost of goods sold	5,40,000
Add : Closing stock	35,000
	5,75,000
Less : Opening stock	35,000
Total Purchases in 1993-94	5,40,000

(3) *Calculation of Debtors for the year 1993-94 :*

	Rs.
Credit sales (1993-94)	6,48,000
Debtors credit	2 months.
Hence, Debtors = $6,48,000 \times \frac{2}{12}$	1,08,000

(4) *Calculation of Creditors for the year 1993-94*

	Rs.
Credit Purchases	5,40,000
Creditors allow credit	1 month.
So, Creditors = $5,40,000 \times \frac{1}{12}$	= 45,000

(5) **TOTAL DEBTORS ACCOUNT**

	Rs.		Rs.
To Balance b/d	90,000	By Cash (Balancings figure)	6,30,000
To Sales (credit)	6,48,000	By Balance c/d	1,08,000
	7,38,000		7,38,000

(6) **TOTAL CREDITORS ACCOUNT**

	Rs.		Rs.
To Cash (balancing figure)	5,25,000	By Balance b/d	30,000
To Balance c/d	45,000	By Purchases	5,40,000
	5,70,000		5,70,000

(7) **CASH ACCOUNT**

	Rs.		Rs.
To Balance b/d	6,000	By Misc. Expenses (1,80,000 – 35,000 –5,000)	1,40,000
To Total Debtors (Collections)	30,000		

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To Sales	1,62,000	By Repairs	2,500
		By Travelling Expenses	12,000
		By Private Drawings	36,000
		By Balance c/d (stolen by cashier)	7,500
	1,98,000		1,98,000

(8) **BANK ACCOUNT**

	Rs.		Rs.
By Balance b/d	11,000	By Total Creditors (Payments)	5,25,000
To Total Debtors (collections)	6,00,000	By Misc. Expenses	35,000
		By Machinery	50,000
		By Balance c/d	1,000
	6,11,000		6,11,000

(9) **PROFIT AND LOSS ACCOUNT**

(For the year ended 31.3.1994)

	Rs.		Rs.
To Opening stock	35,000	By sales :	
		Cash	1,62,000
	5,40,000	Credit	6,48,000
To Purchases	2,70,000	By Closing stcok	35,000
To Gross Profit	8,45,000		8,45,000
			2,70,000
	2,500	By Gross Profit	
To Repairs	12,000		
To Travelling expenses	7,500		
To Cash stolen			
To Misc. expenses paid 1,75,000			
Add outstanding 5,000	1,80,000		
To Depreciation on machinery @ 10%	9,000		
To Net Profit	59,000		
	2,70,000		2,70,000

(10) *Calculation of Funds from Operations*

		Rs.
	Net Profit as per P/L A/c	59,000
Add :	Non fund/Non-operating items :	
	Depreciation	9,000
		68,000
Less :	Non-operating Income	—
	Funds from operations	68,000

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SCHEDULE OF CHANGES IN WORKING CAPITAL

	1993	*1994*	*Increase in W.C.*	*Decrease in W.C.*
	Rs.	*Rs.*	*Rs.*	*Rs*
Current Assets :				
Sundry Debtors	90,000	1,08,000	18,000	—
Stock	35,000	35,000	—	—
Cash in hand	6,000	—	—	6,000
Cash at bank	11,000	1,000	—	10,000
	1,42,000	1,44,000		
Current Liabilities :				
Creditors	30,000	45,000	—	15,000
Outstanding expenses	—	5,000	—	5,000
	30,000	50,000		
Working Capital (C.A.–C.L.)	1,12,000	94,000		
Net Decrease in W.C.		18,000	18,000	
	1,12,000	1,12,000	36,000	36,000

STATEMENT OF SOURCES AND APPLICATION OF FUNDS

Sources	*Rs.*	*Applications*	*Rs.*
Funds from Opertions	68,000	Purchase of machinery	50,000
Net Decrease in Working Capital (balancing figure)	18,000	Drawings	36,000
	86,000		86,000

Problem 3.48 Below is given the Balance Sheet of Chhatrak and Company Limited as at 31st March, 1989 and its Estimated Profit and Loss Account for the year ending 31st March, 1990.

BALANCE SHEET

as at 31st March, 1989

Liabilities	*Rs.*	*Assets*	*Rs.*
Share Capital (Fully Paid shares of Rs. 100 each)		Production Plant and equipment	13,60,000
7% Redeemable Preference shares	3,50,000	*Less :* Depreciation	3,10,000
Equity Shares	6,00,000		10,50,000
Share Premium	80,000	Goodwill	1,50,000
General Reserve	1,80,000	Patents	60,000
6% Debentures	2,50,000	Stock	2,80,000
Creditors for goods	1,60,000	Book Debts	2,80,000
Outstanding expenses	40,000	Cash at bank	85,000
Provision for taxation	1,75,000	Underwriting Commission	20,000
Proposed Dividend (Equity)	90,000		
	19,25,000		19,25,000

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ESTIMATED PROFIT AND LOSS ACCOUNT (1989-90)

	Rs.			Rs.
Opening stock	2,80,000	Sales :		
Purchases	16,80,000	Cash	4,60,000	
Wages	1,00,000	Credit	23,40,000	
Manufacturing Expenses	1,50,000			28,00,000
Depreciation	1,80,000	Stock		2,70,000
Selling & Distribution expenses	1,30,000	Misc. Income		25,000
Office & Administrative expenses	1,10,000	Profit on Sale of machinery		4,500
Interest	25,000			
Goodwill written off	30,000			
Patents written off	15,000			
Provision for taxation	1,90,000			
Preference Dividend	24,500			
Proposed Dividend	90,000			
Balance of Profit	95,000			
	30,99,500			30,99,500

Additional Information :

(a) Both preference shares and debentures are due for redemption on 31st March, 1990. Half the debentureholders in value will accept new 9% redeemable preference shares. The company also proposes to issue equity capital with a nominal value Rs. 2,00,000 at a premium of 10%.

(b) There will be addition to fixed assets for Rs. 1,80,000. The cost of assets to be sold in the year 1989-90 is Rs. 75,000 (accumulated depreciation thereon Rs. 38,000).

(c) Tax Liability upto 31.3.1989 will be settled for Rs. 1,70,000.

(d) Book debts on 31st March, 1990 are to be taken at 10% more than as warranted by the period of $1^1/_2$ months.

(e) Credtitors for goods will continue to extend one month credit. Outstanding and prepaid expenses on 31st March, 1990 will be Rs. 30,000 and Rs. 4,000 respectively.

You are required to prepare a projected Fund Flow Statement for the year ending 31st March, 1990. *[C.A. Final (New)]*

Solution :

(1) *Calculation of Book Debts as on 31.3.1990 :*

	Credit sales (1989–90)	= Rs. 23,40,000
	$1^1/_2$ months sales = Rs. 23,40,000 × 3/24	= Rs. 2,92,500
Add :	10% [as given in *(d)*]	= Rs. 29,250
		3,21,750

(2) *Calculation of Collections from debtors :*

		Rs.
	Opening balance of debtors	2,80,000
Add :	Credit sales during the year	23,40,000
		26,20,000
Less :	Closing debtors	3,21,750
	Collections from debtors during 1989-90	22,98,250

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OR

TOTAL DEBTORS ACCOUNT

	Rs.		Rs.
To Balance b/d	2,80,000	By Cash/Bank	22,98,250
To Sales	23,40,000	(Balancing figure)	
		By Balance c/d	3,21,750
	26,20,000		26,20,000

(3) *Calculation of Payment to Creditors :*

		Rs.
	Opening balance of creditors	1,60,000
Add :	Purchases during the year	16,80,000
		18,40,000
Less :	Creditors at the end (16,80,000 × 1/12)	1,40,000
		17,00,000

OR

TOTAL CREDITORS ACCOUNT

	Rs.		Rs.
To Cash/Bank	17,00,000	By Balance b/d	1,60,000
(Balancing figure)		By Purchases	16,80,000
To balance c/d	1,40,000		
	18,40,000		18,40,000

(4) **CASH/BANK ACCOUNT**

	Rs.		Rs.
To Balance b/d	85,000	By Creditors (3)	17,00,000
To Debtors (2)	22,98,250	By Fixed Assets	1,80,000
To Share Capital	2,00,000	By Manufacturing and	
To Share Premium	20,000	other expenses	5,29,000
To Plant & Equipment (5)	41,500	By Preference Dividend	
To Sales (cash)	4,60,000	(1989-90)	24,500
To Misc. Income	25,000	By Proposed Dividend	
To balance c/d (overdraft)	38,750	on equity shares	
		(Previous year)	90,000
		By 7% Preference shares	3,50,000
		By 6% Debentures	
		(1/2 of 2,50,000)	1,25,000
		By Payment of Tax	1,70,000
	31,68,500		31,68,500

(5) **PLANT AND EQUIPMENT ACCOUNT AT COST**

(Fixed Assets)

	Rs.		Rs.
To Balance b/d	13,60,000	By Accumulated Depreciation Account	38,000
To P/L A/c (Profit on sale)	4,500	By Bank Account (sale)	
To Bank Account		(75,000 – 38,000 + 4,500)	41,500
(Purchase of Fixed Assets)	1,80,000	By Balance c/d	14,65,000
	15,44,500		15,44,500

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(6) ACCUMULATED DEPRECIATION ACCOUNT

	Rs.		Rs.
To Plant & Equipment Account	38,000	By Balance b/d	3,10,000
To Balance c/d	4,52,000	By P/L A/c (Dep. charged)	1,80,000
	4,90,000		4,90,000

(7) *Calculation of Payment of Manufacturing and other expenses :*

	Rs.
Wages	1,00,000
Manufacturing expenses	1,50,000
Selling and Distribution Expenses	1,30,000
Interest	25,000
Office & Administrative expenses	1,10,000
Prepaid Expenses	4,000
Outstanding expenses of previous year	40,000
	5,59,000
Less : Outstanding expenses of current year	30,000
Expenses Paid during 1989-90	5,29,000

(8) *Calculation of Funds from Operations :*

	Rs.
Net Profit as given	95,000
Add : Non-fund/Non-operating items charged to P/L A/c :	
Depreciation	1,80,000
Goodwill written off	30,000
Patents written off	15,000
Preference Dividend	24,500
Proposed Equity Dividend	90,000
Add : Saving in tax (as it will increase funds, (1,75,000–1,70,000)	5,000
	4,39,500
Less : Non-operating incomes credited to P/L A/c :	
Profit on sale of machinery	4,500
Funds from Operations	4,35,000

SCHEDULE OF CHANGES IN WORKING CAPITAL

	1989	*1990*	*Increase in W.C.*	*Decrease in W.C.*
	Rs.	*Rs.*	*Rs.*	*Rs*
Current Assets :				
Debtors	2,80,000	3,21,750	41,750	—
Stock	2,80,000	2,70,000	—	10,000
Cash at bank	85,000	—	—	85,000
Prepaid expenses	—	4,000	4,000	—
	6,45,000	5,95,750		

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Current Liabilities :				
Creditors	1,60,000	1,40,000	20,000	—
Bank overdraft	—	38,750	—	38,750
Outstanding expenses	40,000	30,000	10,000	—
Provision for taxation	1,75,000	1,90,000	—	15,000
	3,75,000	3,98,750		
Working Capital (C.A.–C.L.)	2,70,000	1,97,000		
Net Decrease in W.C.		73,000	73,000	
	2,70,000	2,70,000	1,48,750	1,48,750

PROJECTED FUND FLOW STATEMENT

(for the year ending 31st March, 1990)

Sources	*Rs.*	*Applications*	*Rs.*
Issue of equity shares	2,00,000	Redemption of debentures	2,50,000
Share premium	20,000	Redemption of preference shares	3,50,000
Issue of preference shares	1,25,000		
Sale of machinery	41,500	Purchase of fixed assets	1,80,000
Funds from operations	4,35,000	Payment of preference dividend	24,500
Net Decrease in W.C.	73,000	Payment of proposed dividend for previous year	90,000
	8,94,500		8,94,500

Problem 3.49. The financial statements and operating results of Sunrise Ltd. revealed the following position as on 31st March, 1989 :

1. Equity Share Capital (Rs. 10 per Share fully paid-up) — Rs. 1,00,000
2. Working Capital — Rs. 78,000
3. Bank Overdraft — Rs. 12,000
4. Current Ratio — 2.5
5. Quick Ratio — 1.5
6. Proprietary Ratio (Fixed assets : Proprietary Fund) — 0.6
7. Gross profit Ratio — 25%
8. Stock Velocity — 5
9. Debtors Velocity — 1.5 month
10. Net Profit to Sales — 15%

Expenses included depreciation Rs. 13,000. Closing Stock was 25% higher than the opening stock. There were also free Reserves brought forward from earlier years. Current assets included stock, debtors and cash only. There were no fictitious assets.

The following information was gathered from the books and records for the year ended 31st March, 1990 :

1. With effect from April 1, 1989 the sale price was enhanced by 5%. Total sales for the year were 20% higher as compared to the previous year.

2. Stock level was raised to Rs. 90,000 from April and maintained at that level throughout the year.

3. Percentage of Gross profit on turnover has gone up from 25% to 30%.

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4. A portion of the fixed assets being very old (book value Rs. 12,000) was disposed of for Rs. 6,000 (No depreciation to be provided on this item).

5. Percentage of depreciation to fixed assets to be provided (at the rate as in the previous year).

6. Expenses outstanding on 31st, March, 1990–Rs. 2,500.

7. Ratio of Net Profit to sales – 16%.

8. Debtors and Creditors on 31st March 1990 were for Rs. 66,150 and Rs. 32,500 respectively.

9. Amount paid to creditors for the year–Rs. 3,97,940.

10. Bank overdraft–fully discharged.

As a consultant, you are requested by the Board of Directors of the Company to prepare and submit a Fund Flow Statement for the year ended 31st March, 1990 Ignore Dividend and Taxation. *(C.A. Final)*

Solution :

Workings For 1989

(a) *Calculation of current assets and current liabilities :*

Current Ratio = 2.5

So, if current liabilities = X

Current assets = 2.5 X

Working Capital = Current Assets – Current Liabilities

$78,000 = 2.5 \times - X$

Or, $X = 52,000$

$\therefore$ Current Liabilities = Rs. 52,000

and, Current Assets = $2.5 \times 52,000$

= Rs. 1,30,000

(b) Quick Liabilities = Current Liabilities – Bank–Overdraft

= Rs. 52,000 – 12,000

= Rs. 40,000

(c) Quick Ratio = 1.5

or, Quick Assets : Quick Liabilities = 1.5

$\therefore$ Quick Assets = $1.5 \times 40,000$

= Rs. 60,000

(d) Closing Stock = Current Assets – Quick Assets

= 1,30,000 – 60,000

= Rs. 70,000

(e) Opening Stock = $\frac{4}{5} \times 70,000$ (as closing stock is 25% higher than opening stock)

= Rs. 56,000

(f) Average Stock = $\frac{\text{Op. Stock + Cl. Stock}}{2}$

= $\frac{56,000 + 70,000}{2}$

= Rs. 63,000

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(*g*) Cost of Sales = Average Stock × Stock Velocity
= 63,000 × 5
= Rs. 3,15,000

(*h*) Gross Profit = $\frac{1}{3}$ of Cost of Sales
= $\frac{1}{3}$ × 3,15,000 = Rs. 1,05,000

(*i*) Sales = Cost of Sales + Gross Profit
= Rs. 3,15,000 + 1,05,000
= Rs. 4,20,000

(*j*) Debtors = 4,20,000 × $\frac{3}{24}$
= Rs. 52,500

(*k*) Net Profit = 15% of Sales
= $\frac{15}{100}$ × 4,20,000
= Rs. 63,000

(*l*) Fixed Assets/Proprietory Funds = 0.6
∴ Working Capital/Proprietory Funds = 0.4
As Working Capital = Rs. 78,000
Proprietory Funds = 78,000 × $\frac{10}{4}$
= Rs. 1,95,000
Hence, Fixed Assets = 1,95,000 $\frac{6}{10}$
= Rs. 1,17,000

(*m*) Cash and Bank = Quick Assets – Debtors
= 60,000 – 52,500
= Rs. 7,500

(h) **BALANCE SHEET AS AT 31ST MARCH 1989**

Liabilities	*Rs.*	*Assets*	*Rs.*
Share Capital	1,00,000	Fixed Assets	1,17,000
		Current Assets :	
Profit and Loss A/c	63,000	Stock	70,000
Bank Overdraft	12,000	Debtors	52,500
Sundry Creditors	40,000	Cash and Bank	7,500
General Reserve (balancing figure)	32,000		
	2,47,000		2,47,000

WORKING NOTES FOR 1990

(*a*) *Sales :*

	Rs.
Sales for the year 1989 =	4,20,000
Add : 20% increase in volume =	84,000
	5,04,000
Add : 5% increase in selling price	25,200
	5,29,200

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(b) *Expenses paid during the year :*

		Rs.
Gross Profit (30% on 5,29,200)		= 1,58,760
Net Profit (16% on 5,29,200)		= 84,672
Total Expenses Charged		= 74,088
Less : Expenses not paid :		
Loss on sale of assets	6,000	
Depreciation	10,500	
Outstanding expenses	2,500	19,000
		55,088

(c) *Cash received from Debtors :*

	Rs.
Opening Balance of Debtors	= 52,500
Add : Sales made during the year	= 5,29,200
	5,81,700
Less : Debtors at the end (given)	66,150
Cash received during the year	5,15,550

(d) *Purchases :*

	Rs.
Closing balance of creditors	= 32,500
Add : Cash paid to creditors during the year	= 3,97,940
	4,30,440
Less : Opening balance of creditors	40,000
Purchases	3,90,440

(e) **CASH AND BANK A/C**

	Rs.		Rs.
To Balance b/d	7,500	By Creditors	3,97,940
To Debtors	5,15,550	By Expenses	55,088
To Sale of Assets	6,000	By Bank Overdraft	12,000
		By Balance c/d	64,022
	5,29,050		5,29,050

(1) **TRADING AND PROFIT AND LOSS ACOUNT**

for the year ended 31.3.1990

		Rs.		Rs.
To Opening Stock		70,000	By Sales	5,29,200
To Purchases		3,90,440	By Closing Stock	90,000
To Gross Profit (30% on Sales)		1,58,760	(balancing figure)	
		6,19,200		6,19,200
To Expenses	55088		By Gross Profit	1,58,760
Add : Outstanding	2500	57,588		
To Depreciation		10,500		
To Loss on sale of fixed assets		6,000		
To Net Profit		84,672		
		1,58,760		1,58,760

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BALANCE SHEET

(as on 31.3.1990)

Liabilities		*Rs.*	*Assets*		*Rs.*
Share Capital		1,00,000	Fixed Assets	1,17,000	
			Less : Sold during the year	12,000	
General Reserve		32,000		1,05,000	
			Less Depreciation	10,500	
P/L A/c :					94,500
1989	63,000		Stock in trade		90,000
1990	84,672	1,47,672	Sundry Debtors		66, 150
Sundry Creditors		32,500	Cash and Bank		64,022
Outstanding Expenses		2,500			
		3,14,672			3,14,672

(2) STATEMENT OF SOURCES AND APPLICATION OF FUNDS

Sources		*Rs.*	*Applications*	*Rs.*
Sale of Fixed Assets		6,000	Increase in Working Capital	1,07,172
Funds from operations :				
Net Profit for the year	84,672			
Add : Non-Fund/non -operating items :				
Depreciation	10,500			
Loss on sale of fixed assets	6,000	1,01,172		
		1,07,172		1,07,172

(3) STATEMENT OF CHANGES IN WORKING CAPITAL

	1989	*1990*	*Increase in W.C.*	*Decrease in W.C.*
	Rs.	*Rs.*	*Rs.*	*Rs*
Current Assets :				
Stock	70,000	90,000	20,000	
Debtors	52,500	66,150	13,650	
Cash and Bank	7,500	64,022	56,522	
Total of Current-Assets	1,30,000	2,20, 172		
Current Liabilities :				
Creditors	40,000	32,500	7,500	
Outstanding Expenses	—	2,500	—	2,500
Bank Overdraft	12,000	—	12,000	
Total of Current Liabilities	52,000	35,000		
Working Capital (C.A.–C.L.)	78,000	1,85,172		
Net Increase in Working Capital	1,07,172			1,07,172
	1,85,172	1,85,172	1,09,672	1,09,672

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Problem 3.50 From the following Balance Sheet of X Ltd. as on 31st March, 1992 and the other information as set forth below prepare Projected Funds Statement for the year ended 31st March, 1993 :

BALANCE SHEET OF X LTD. AS ON 31ST MARCH, 1992

Liabilities	*Rs.*	*Assets*		*Rs.*
Equity Shares of Rs. 10 each	5,00,000	Goodwill		1,00,000
12% Redeemable Preference shares of Rs. 100 each	50,000	Other Fixed Assets	5,00,000	
		Less : Depreciation	2,00,000	3,00,000
Share Premium Account	50,000	Stock		2,30,000
Profit and Loss Account	80,000	Debtors		2,00,000
Trade Creditors	1,00,000	Cash and Bank		80,000
Expense Creditors	30,000			
Provision for Income-tax (net of payments)	1,00,000			
	9,10,000			9,10,000

Sales and expenses are budgeted at Rs. 20,00,000 and Rs. 3,00,000 respectively. Gross profit percentage and stock velocity are estimated at 30% and 7 times respectively. Debtors and cereditors velocities are estimated at 73 days and 3 months respectively. There will be one month's time lag in payment of expenses. Machine worth Rs. 50,000 is to be purchased in the year and a machine costing Rs. 50,000 (accumulated depreciation Rs. 40,000) is to be sold at book value.

Redeemable preference shares are to be redeemed at 10% premium by issue of 10,000 Equity Shares of Rs. 10 at 5% premium.

10% dividend is to be paid in total out of which half is estimated to be paid as interim dividend.

Assessment for 1990-91 assessment year is expected to be completed in the year ending 31st March, 1993 and Rs. 10,000 additional payment is likely to be required. Income-tax provision of Rs. 40,000 was made in the accounts for the year ending 31st March, 1990 and advance Income Tax Payment also amounted to Rs. 40,000 in the same year. Rs. 1,00,000 advance tax will be paid in the year ending 31st March, 1993. Income Tax provision is to be made at 50% of net profit and depreciation is to be charged at 10% on cost. *(C.A. Final)*

Working Notes :

(1) *Budgeted Income Statement for the year 1992-93*

		Rs.
Sales (given)		20,00,000
Less : Cost of sales (as G.P. 30%)		14,00,000
Gross Profit		6,00,000
Less : Expenses (given)	3,00,000	
Depreciation (10% on cost)	50,000	3,50,000
Profit Before Tax		2,50,000
Less : Provision for Current Tax (50%)	1,25,000	
Arrears of Tax (given)	10,000	1,35,000
Profit After tax		1,15,000
Less : Interim Dividend	30,000	
Proposed Dividend	30,000	60,000

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	55,000
Add : Opening Balance of P/L A/c	80,000
	1,35,000

(2) *Calculation of Sundry Debtors*

$$\text{Debtors} = \text{Sales} \times \frac{73}{365} \quad \text{(as sales velocity is given)}$$

$$= 20,00,000 \times \frac{73}{365} = \text{Rs. } 4,00,000$$

(3) *Calculation of Closing Stock*

$$\text{Stock Velocity} = \frac{\text{Cost of Sales}}{\text{Average Stock}}$$

$$\text{Or, } 7 = \frac{14,00,000}{\text{Average Stock}}$$

$$\text{Or, Average Stock} = \frac{14,00,000}{7} = \text{Rs. } 2,00,000$$

$$\text{Average Stock} = \frac{\text{Opening Stock} + \text{Closing Stock}}{2}$$

Or, 2 × Average Stock = Opening Stock + Closing Stock
Or, 2 × 2,00,000 = 2,30,000 + Closing Stock
Or, Closing Stock = Rs. 4,00,000 – 2,30,000 = Rs. 1,70,000

(4) *Calculation of Purchases and Sundry Creditors*

Cost of Sales = Opening Stock + Purchases – Closing Stock
Or, Purchases = Cost of Sales – Opening Stock + Closing Stock
Purchases = 14,00,000 – 2,30,000 + 1,70,000
Purchases = Rs. 13,40,000

$$\text{Creditors} = \text{Purchases} \times \frac{3}{12}$$

(as Crs. Velocity is given to be 3 months)

$$= 13,40,000 \times \frac{3}{12} = 3,35,000$$

(5) *Calculation of Expenses Creditors*

$$\text{Expenses Creditors} = \text{Total Expenses} \times \frac{1}{12}$$

(as lag in payment is 1 month)

$$= 3,00,000 \times \frac{1}{12} = \text{Rs. } 25,000$$

(6) **SUNDRY DEBTORS A/C**

	Rs.		Rs.
To Balance b/d	2,00,000	By Cash/Bank (balancing figure)	18,00,000
To Sales	20,00,000	By Balance c/d	4,00,000
	22,00,000		22,00,000

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(7) **SUNDRY CREDITORS A/C**

	Rs.		Rs.
To Cash/Bank (Balancing figure)	11,05,000	By Balance b/d	1,00,000
To Balance c/d	3,35,000	By Purchases	13,40,000
	14,40,000		14,40,000

(8) **EXPENSE CREDITORS A/C**

	Rs.		Rs.
To Cash/Bank (balancing figure)	3,05,000	By Balance b/d	30,000
		By Expenses	3,00,000
To Balance c/d	25,000		
	3,30,000		3,30,000

(9) **CASH AND BANK A/C**

	Rs.		Rs.
To Balance b/d	80,000	By Preference Shareholders (50,000 + 10% Premium)	55,000
To Equity Share Capital	1,00,000		
To Share Premium (5%)	5,000	By Machinery (Purchase)	50,000
To Sundry Debtors	18,00,000	By Sundry Creditors	11,05,000
To Machinery (Sale)	10,000	By Expense Creditors	3,05,000
		By Income Tax (Arears)	10,000
		By Income Tax (Advance)	1,00,000
		By Interim Dividend	30,000
		By Balance c/d	3,40,000
	19,95,000		19,95,000

(10) **PROJECTED BALANCE SHEET**

(as on 31.3.1993)

Liabilities	Rs.	*Assets*		Rs.
Equity Share Capital	6,00,000	Goodwill		1,00,000
Share Premium	50,000	Other Fixed Assets	5,00,000	
Profit and Loss Account	1,35,000	*Less :* Acc. Dep.	2,10,000	2,90,000
Trade Creditors	3,35,000	Stock		1,70,000
Expenses Creditors	25,000	Debtors		4,00,000
Provision for Tax	1,25,000	Cash and Bank		3,40,000
Proposed Dividend	30,000			
	13,00,000			13,00,000

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STATEMENT OF CHANGES IN WORKING CAPITAL

	31.3.1992	*31.3.1993*	*Increase in W.C.*	*Decrease in W.C.*
	Rs.	*Rs.*	*Rs.*	*Rs*
Current Assets :				
Stock	2,30,000	1,70,000	—	60,000
Debtors	2,00,000	4,00,000	2,00,000	
Cash and bank	80,000	3,40,000	2,60,000	
Total of Current Assets	5,10,000	9,10,000		
Current Liabilities :				
Trade Creditors	1,00,000	3,35,000		2,35,000
Expense Creditors	30,000	25,000	5,000	
Provision for Tax	1,00,000	1,25,000		25,000
Total of current Liabilities	2,30,000	4,85,000		
Working Capital (C.A.–C.L.)	2,80,000	4,25,000		
Net Increase in W.C.	1,45,000			1,45,000
	4,25,000	4,25,000	4,65,000	4,65,500

Note :

(i) Provision for Tax has been taken as a current liability.

(ii) Proposed Dividend has not been taken as current liability.

PROJECTED FUNDS STATEMENT

For the Year ended 31.3.1993

Sources	*Rs.*	*Applications*	*Rs.*
Issue of Equity Shares	1,00,000	Redemption of Pref. Shares	55,000
Share Premium	5,000	Purchase of Machinery	50,000
Sale of Machinery	10,000	Interim Dividend	30,000
Funds from Operations (a)	1,65,000	Net Increase in W.C.	1,45,000
	2,80,000		2,80,000

(a) **ADJUSTED PROFIT AND LOSS ACCOUNT**

	Rs.		*Rs.*
To Depreciation	50,000	By Balance b/d	80,000
To Interim Dividend	30,000	By Funds from Operations	
To Proposed Dividend	30,000	(balancing figure)	1,65,000
To Balance c/d	1,35,000		
	2,45,000		2,45,000

Problem 3.51 The Balance Sheets of Z Ltd. as on 31st December, 1994 and 1995 are given below :

	31.12.94	31.12.95
	Rs.	*Rs.*
Share Capital	3,00,000	4,00,000
Capital Reserve		10,000

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General Reserve	1,70,000	2,00,000
Profit & Loss Account	60,000	75,000
Debentures	2,00,000	1,40,000
Current Liabilities	1,20,000	1,30,000
Provision for Income Tax	90,000	85,000
Proposed Dividend	30,000	36,000
Unpaid dividend	—	4,000
	9,70,000	10,8,000
Fixed Assets : At cost	8,00,000	9,50,000
Less : Depreciation	2,30,000	2,90,000
	5,70,000	6,60,000
Trade Investment	1,00,000	80,000
Current Assets	2,80,000	3,30,000
Preliminary Expenses	20,000	10,000
	9,70,000	10,80,000

During the year 1995, the Company.

(1) Sold one machine for Rs. 25,000 the cost of which was Rs. 50,000 and the depreciation provided on it was Rs. 21,000.

(2) Provided Rs. 95,000 as depreciation.

(3) Redeemed 30% of the debentures @ 103.

(4) Sold some trade investments at a profit which was Credited to Capital Reserve.

(5) Decided to value stock at cost where as previously the practice was to value stock at cost less 10%. The stock according to books on 31.12.94 was Rs. 54,000. The stock on 31.12.95 was correctly valued at cost Rs. 75,000, and

(6) Decided to write off Fixed Assets costing Rs. 14,000 (fully depreciated).

You are required to prepare the Statement of Sources and Application of Funds during 1995, showing the changes in the Working Capital. *(C.A. Final)*

Solution :

STATEMENT OF CHANGES IN WORKING CAPITAL

	1994	*1995*	*Increase in W.C.*	*Decrease in W.C.*
	Rs.	*Rs.*	*Rs.*	*Rs*
Current Assets : (As given)	2,80,000	3,30,000		
Add : Write up for opening stock $54,000 \times \frac{10}{90}$	6,000	=		
Total Current Assets	2,86,000	3,30,000	44,000	
Current Liabilities (as given)	1,20,000	1,30,000		10,000
Working Capital (C.A.–C.L.)	1,66,000	2,00,000		
Net Increase in W.C.	34,000			34,000
	2,00,000	2,00 000	44,000	44,000

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STATEMENT OF SOURCES AND APPLICATIONS OF FUNDS

Sources	*Rs.*	*Applications*	*Rs.*
Issue of share capital	1,00,000	Purchase of Fixed Assets	2,14,000
Sale of Machine	25,000	Redemption of Debentures (60,000 + 3%)	61,800
Sale of Trade Investments	30,000	Proposed Dividend paid	
Funds from Operations	2,70,800	(for 1994 Rs. 30,000 – 4,000)	26,000
		Provision for Tax 1994 (assumed to be paid)	90,000
		Net Increase in W.C.	34,000
	4,25,800		4,25,800

Workings :

(1) As current liabilities are specifically given, proposed dividend and provision for tax have been treated as non-current liabilities.

(2) **SHARE CAPITAL A/C**

	Rs.		*Rs.*
		By Balance b/d	3,00,000
To Balance c/d	4,00,000	By Cash/Bank (balancing figure)	1,00,000
	4,00,000		4,00,000

(3) **CAPITAL RESERVE A/C**

	Rs.		*Rs.*
		By Balance b/d	—
To Balance c/d	10,000	By Trade Investments A/c (Profit on Sale)	10,000
	10,000		10,000

(4) **GENERAL RESERVE A/C**

	Rs.		*Rs.*
		By Balance b/d	1,70,000
To Balance c/d	2,00,000	By Adjusted P/L A/c	30,000
	2,00,000		2,00,000

(5) **DEBENTURES A/C**

	Rs.		*Rs.*
To Cash/Bank (balancing figure)	60,000	By Balance b/d	2,00,000
To Balance c/d	1,40,000		
	2,00,000		2,00,000

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(6) FIXED ASSETS (AT COST) A/C

	Rs.		Rs.
To Balance b/d	8,00,000	By Cash (Sale)	25,000
To Cash-Purchase		By Accumulated Dep.	21,000
(balancing figure)	2,14,000	By Adjusted P/L A/c (Loss on sale)	4,000
		By Accumulated Dep. A/c (Fixed Assets written off)	14,000
		By Balance c/d	9,50,000
	10,14,000		10,14,000

(7) ACCUMULATED DEPRECIATION A/C

	Rs.		Rs.
To Fixed Assets A/c		By Balance b/d	2,30,000
(Dep. on machine sold)	21,000	By Adjusted P/L A/c	95,000
To Fixed Assets A/c	14,000	(Dep. provided during the year)	
(Written off)			
To Balance c/d	2,90,000		
	3,25,000		3,25,000

(8) TRADE INVESTMENTS A/C

	Rs.		Rs.
To Balance b/d	1,00,000	By Cash (sale)	30,000
To Capital Reserve A/c	10,000	(balancing figure)	
		By Balance c/d	80,000
	1,10,000		1,10,000

(9) PRELIMINARY EXPENSES A/C

	Rs.		Rs.
To Balance b/d	20,000	By Adjusted P/L A/c (Write off-balancing figure)	10,000
		By Balance c/d	10,000
	20,000		20,000

(10) ADJUSTED PROFIT AND LOSS A/C

	Rs.		Rs.
	30,000	By Balance b/d	60,000
To Transfer to General Reserve	1,800	By Opening stock written up	6,000
To Loss on Redemption of Debentures	4,000		
To Loss on sale of Machine	95,000	By Funds from Operations	2,70,800
To Depreciation provided	10,000	(balancing figure)	
To Preliminary Expenses	36,000		
To Proposed Dividend	85,000		
To Provision for Income Tax	75,000		
To Balance c/d	3,36,800		3,36,800

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Problem 3.52. From the following balance sheet of AKV Ltd., a wholly owned subsidiary of PQR Ltd ; prepare a statement of sources and application of funds and schedule of changes in working capital (with column for changes in other assets) :

Balance Sheet

Liabilities	*March 31,* 1996	*March 31,* 1997	*Assets*	*March 31,* 1996	*March 31,* 1997
Current Liabilities	20,000	2,50,000	Current Assets	4,00,000	5,01,000
Capital Surplus	300,000	—	Net Fixed Assets	10,00,000	10,16,000
Earned Surplus	7,00,000	—	Deferred Charges	50,000	40,000
Equity Capital	8,00,000	—	Goodwill	6,50,000	60,000
Inter-Company Account	1,00,000	13,67,000			
	21,00,000	16,17,000		21,00,000	16,17,000

On June 30 Rs. 6,00,000 of goodwill was charged off, Rs. 3,00,000 to capital surplus and Rs. 3,00,000 to earned surplus. In the first half of the year, the subsidiary bought the assets of a business, consisting of some fixed assets and goodwill and Rs. 50,000 for inventory and accounts receivable. The total amount paid was Rs. 1,70,000. Old machinery was sold for Rs. 1,000 ; it had a book value of Rs. 12,000 and Rs. 8,000 depreciation has been provided. On September 30, the Subsidiary Company was dissolved and was made a division of Parent Company. Its accounts continued in a separate divisional ledger. A net profit of Rs. 3,17,000 after providing Rs. 80,000 for depreciation and Rs. 10,000 for amortisation of goodwill, has been made was credited to inter-company account. The deferred charges consist of unexpired insurance and prepaid current expenses.

Solution :

SCHEDULE OF CHANGES IN WORKING CAPITAL

	March 31, 1996 Rs.	*March 31, 1997 Rs.*	*Changes in W.C. Rs*	*Changes in Other Assets Rs.*
Assets :				
Current Assets	4,00,000	5,01,000	(+) 1,01,000	—
Net Fixed Assets	10,00,000	10,16,000	—	(+) 16,000
Deferred Charges	50,000	40,000	—	(–) 10,000
Goodwill	6,50,000	60,000	—	(–) 5,90,000
Total	21,00,000	16,17,000	(+) 1,01,000	(–) 5,84,000
Liabilities :				
Current Liabilities	2,00,000	2,50,000	(+) 50,000	—
Capital Surplus	3,00,000	—	—	(–) 3,00,000
Earned Surplus	7,00,000	—	—	(–) 7,00,000
Equity Capital	8,00,000	—	—	(–) 8,00,000
Inter-Company Account	1,00,000	13,67,000	—	(+) 12,67,000
Total	21,00,000	16,17,000	(+) 50,000	(–) 5,33,000
Increase in W.C.			(+) 51,000	(–) 51,000
			(+) 1,01,000	(–) 5,84,000

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STATEMENT OF SOURCES AND USES OF FUNDS

Sources	*Rs.*	*Uses*	*Rs.*
Loan from Holding Company (1)	9,50,000	Purchases of Fixed Assets (2)	1,00,000
Sale of Plant	1,000	Redemption of Equity Capital	8,00,000
		Purchase of Goodwill (4)	20,000
Funds from Operations (6)	4,20,000	Payment of Dividend (5)	4,00,000
		Net Increase in W.C.	51,000
	13,71,000		13,71,000

Working Notes :

(1) INTER-COMPANY ACCOUNT

	Rs.		*Rs.*
		By Balance b/d	1,00,000
		By Net Profit	3,17,000
		By Cash/Bank A/c	
To Balance c/d	13,67,000	(Loan provided by holding company-balancing figure)	9,50,000
	13,67,000		13,67,000

(2) FIXED ASSETS A/C

	Rs.		*Rs.*
To Balance b/d	10,00,000	By Depreciation	80,000
To Cash/Bank		By Cash/Bank (Sale)	1,000
(Purchase-balancing figure)	1,00,000	By Adjusted P/L A/c (Loss on sale) (12,000–8,000–1,000)	3,000
		By Balance c/d	10,16,000
	11,00,000		11,00,000

(3) GOODWILL ACCOUNT

	Rs.		*Rs.*
To Balance b/d	6,50,000	By Capital Surplus A/c	3,00,000
To Cash/Bank A/c (4)	20,000	By Earned Surplus A/c	3,00,000
		By Adjusted P/L A/c [Written off Balancing figure]	10,000
		By Balance c/d	60,000
	6,70,000		6,70,000

(4) The subsidiary bought the assets of a business consisting of some fixed assets and goodwill. Out of this Rs. 50,000 are invested in inventory and accounts receivables ; and further Rs. 1,00,000 is invested in fixed assets (Please see Fixed Assets A/c). The total of these assets is Rs. 50,000 + 1,00,000 = Rs. 1,50,000. Thus, the balance of Rs. 20,000 (1,70,000 – 1,50,000) has been paid for goodwill.

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(5) EARNED SURPLUS ACCOUNT

	Rs.		Rs.
To Goodwill (W/o)	3,00,000	By Balance c/d	7,00,000
To Dividend paid (balancing figure)	4,00,000		
	7,00,000		7,00,000

(6) *Calculation of Funds from Operations :*

	Rs.
Net Profit during the year (given)	3,17,000
Add : Non-fund/ non-operating items which have been debited to P/L A/c :	
Depreciation	80,000
Amortisation of Goodwill(3)	10,000
Loss on Sale of Machinery	3,000
Deferred Charges (w/o)	10,000
Funds from Operations	4,20,000

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4

Statement of Changes in Financial Position – II

(Cash Flow Statement)

Problem 4.1. From the following information, calculate cash from operations:

	Rs.
Net Profit for the year	60,000
Total Sales	1,40,000
Debtors outstanding at the end of the year	20,000
Debtors outstanding at the beginning of the year	10,000

Solution :

CALCULATION OF CASH FROM OPERATIONS

	Rs.
Net Profit for the year	60,000
Less: Debtors outstanding at the end of the year	20,000
	40,000
Add : Debtors outstanding in the beginning of the year	10,000
Cash from Operations	50,000

Problem 4.2. Calculate cash from operations from the following information:

	Rs.
Sales of the year	1,00,000
Purchases for the year (including credit purchases of Rs. 20,000)	70,000
Expenses for the year	10,000

Solution :

CALCULATION OF CASH FROM OPERATIONS

		Rs.
Sales of the year		1,00,000
Less : Purchases for the year	70,000	
Expenses for the year	10,000	80,000
Net Profit		20,000
Add: Credit Purchases		20,000
Cash from Operations		40,000

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Problem 4.3. From the following information calculate cash from operations by using actual concept :

	Rs.
Net Profit for the year 1994	80,000
Interest received in advance on 1-1-94	5,000
Interest received in advance on 31-12-94	10,000
Expenses outstanding on 1-1-94	10,000
Expenses outstanding on 31-12-94	15,000

Solution :

CALCULATION OF CASH FROM OPERATIONS

		Rs.
Net Profit for the year 1994		80,000
Add : Interest received in advance on 31-12-94	10,000	
Expenses outstanding on 31-12-94	15,000	25,000
		1,05,000
Less : Interest received in advance on 1-1-94	5,000	
Expenses outstanding on 1-1-94	10,000	15,000
Cash from Operations		90,000

Problem 4.4. Following information is given to you :

	Rs.
Net Profit after taxes	Rs. 6,00,000
Depreciation charged to P and L A/c	Rs. 1,00,000
Loss on sale of machinery written off to P & L A/c	Rs. 20,000

	Opening Balance Rs.	*Closing Balance* Rs.
Debtors	40, 000	50,000
Inventory	1,00,000	1,20,000
Creditors	50,000	60,000
Outstanding Expenses	30,000	20,000

From the above information, ascertain Cash from Operations using actual concept.

Solution :

CALCULATION OF CASH FROM OPERATIONS

		Rs.
Net Profit (as given)		6,00,000
Add: Depreciation changed to P/L A/C	*Rs.* 1,00,000	
Loss on sale of machinery	20,000	
Opening Debtors	40,000	
Opening Inventory	1,00, 000	
Closing Creditors	60,000	
Closing Outstanding Expenses	20,000	3,40,000
		9,40,000
Less : Closing Debtors	50,000	
Closing Inventory	1,20,000	
Opening Creditors	50,000	
Opening Outstanding Expenses	30,000	2,50,000
		6,90,000

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Problem 4.5. *From the following Balance Sheets you are required to prepare a Cash Flow Statement :*

Liabilities	*1990*	*1991*	*Assets*	*1990*	*1991*
	Rs.	*Rs.*		*Rs.*	*Rs.*
Share Capital	2,00,000	2,50,000	Cash	30,000	47,000
Trade Creditors	70,000	45,000	Debtors	1,20,000	1,15,000
P and L A/c	10,000	23,000	Stocks	80,000	90,000
			Land	50,000	66,000
	2,80,000	3,18,000		2,80,000	3,18,000

(B. Com. Punjabi Uni.)

Solution :

CASH FLOW STATEMENT

(for the year ended 31st December (1991)

	Rs.		*Rs.*
Balance of Cash on 1-1-1991	30,000	*Outflows of Cash:* Purchases of Land (66,000–50,000)	16,000
Add: Cash Inflows: Issue of Share Capital (2,50,000-2,00,000)	50,000	Increase in Stock (90,000-80,000)	10,000
Decrease in Debtors (1,20,000-1, 15,000)	5,000	Decrease in Trade Creditors (70,000-45,000)	25,000
Cash Operating Profit (23,000 -10,000)	13,000	Balance of Cash on 31-12-1991	47,000
	98,000		98,000

Problem 4.6. *The Comparative Balance Sheets of Mrs. Wheldon are as follows:*

Liabilities	*1993* *Rs.*	*1994* *Rs.*	*Assets*	*1993* *Rs.*	*1994* *Rs.*
Capital	1,50,000	1,75,000	Land and Building	1,10,000	1,50,000
Loan from Bank	1,60,000	1,00,000	Machinery	2,00,000	1,40,000
Creditors	85,000	93,000	Stock	50,000	45,000
			Debtors	70,000	80,000
Outstanding Expenses	5,000	7,000	Cash	15,000	22,000
Bills Payable	50,000	40,000	Prepaid Expenses	5,000	3,000
Loan from I.F.C.	—	25,000			
	4,50,000	4,40,000		4,50,000	4,40,000

Additional Information :

1. Net Profit for the year 1994 amounted to Rs. 60,000
2. During the year a machine costing Rs. 25,000 (accumulated depreciation Rs. 10,000) was sold for Rs. 13,000. The provision for depreciation against machinery as on 31-12-1993 was Rs. 50,000 and on 31-12-1994 was Rs. 85,000.

You are required to prepare a Cash Flow Statement.

(B.Com; G.N.DU.)

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Solution :

CASH FLOW STATEMENT

(For the year ended 31-12-1994)

	Rs.		Rs.
Balance of Cash on 1-1-1994	15,000	*Outflows of Cash:* Purchase of Land and Building (1,50,000-1,10,000)	40,000
Add; Cash Inflows: Increase in Creditors	8,000	Increase in Debtors	10,000
Raising of Loan from I.F.C.,	25,000	Prepaid Expenses for 1994	3,000
Decrease in Stock	5,000	Outstanding Expenses for 1993 paid	5,000
Sale of Machine	13,000	Drawings	35,000
CashOperating Profit	1,19,000	Payment of Bank Loan	60,000
		Decrease in Bills Payable (50,000-40,000)	10,000
		Balance of Cash on 31-12-1994	22,000
	1,85,000		1,85,0000

Working Notes

(1) MRS. WHELDON'S CAPITAL ACCOUNT

	Rs.		Rs.
To Drawings (balancing figure)	35,000	By Balance b/d	1,50,000
To Balance c/d	1,75,000	By Profit	60,000
	2,10,000		2,10,000

(2) PROVISION FOR DEPRECIATION ACCOUNT

	Rs.		Rs.
To Depreciation on Machine Sold	10,000	By Balance b/d	50,000
To Balance c/d	85,000	By Adjusted P/L Account (Balancing figure)	45,000
	95,000		95,000

(3) MACHINERY ACCOUNT

	Rs.		Rs.
To Balance b/d	2,00,000	By Cash (Sale)	13,000
		By Adjusted P/L Account (Loss on sale)	2,000
		By Depreciation Account	45,000
		By Balance c/d	1,40,000
	2,00,000		2,00,000

(4) ADJUSTED PROFIT AND LOSS ACCOUNT

	Rs.		Rs.
To Loss of sale of Machine	2,000	By Cash (Operating Profit)	1,19,000
To Depreciation	45,000		
To Outstanding Expenses (1994)	7,000		
To Prepaid Exp. (1993)	5,000		
To Profit (for 1994)	60,000		
	1,19,000		1,19,000

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Problem 4.7. The comparative Balance Sheets for X Ltd. are given below:

	31 st Dec; 1989	*31st Dec.1988*
	Rs.	*Rs.*
Assets :		
Cash	82,000	22,000
Debtors	1,04,000	24,000
Stock	1,12,000	60,000
Prepaid Expenses	22,000	14,000
Plant and Machinery	3,80,000	3,60,000
Goodwill	36,000	40,000
	7,36,000	5,20,000
Liabilities :		
Creditors	30, 000	14,000
Provision for Depreciation	1,00,000	60,000
Debentures	1,02,000	1,02,000
Premium on Debenture Issue	12,000	18,000
Share Capital	1,90,000	90,000
Share Premium	30,000	---
Reserves and Surpluses	2,72,000	2,36,000
	2,72,000	5,20,000

The following additional information is available from the accounting records for 1989.

(1) Net Profit for the year Rs.66,000 (2) Debenture Premium of Rs. 6,000 was amortised during the year.

Prepare a statement of changes in Financial Position on cash basis.

Solution :

CASH FLOW STATEMENT

(for the year ended 31-12-1989)

	Rs.		*Rs.*
Opening Balance of Cash	22,000	*Cash Outflows :*	
Add: Cash Inflows:		Purchase of Plant and Machinery (3,80,000-3,60,000)	20,000
Issue of Share Capital (1,90,000–90.000)	1,00,000	Increase in Debtors (1,04,000-24,000)	80,000
Share Premium	30,000		
Increase in creditors (30,000-14,000)	16,000	Increase in Stock (1,12,000-60,000)	52,000
		Prepaid Expenses for 1989	22,000
Cash Operating Profit	88,000	Closing Balance of Cash	82,000
	2,56,000		2,56,000

Workings :

	Rs.
Cash Operating Profit:	
Closing Balance of Reserves and Surpluses	2,72,000
Add: Non-Cash/ non-operating items:	

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Provision for Depreciation (1,00,000-60,000)	40,000	
Goodwill written off (40,000-36,000)	4,000	
Prepaid Expenses for 1988	14,000	58,000
		3,30,000
Less : Opening Balance of Reserves	2,36,000	
Amortisation of Debenture Premium	6,000	2,42,000
Cash Operating Profit		88,000

Problem 4.8. The X Ltd. has prepared the following Balance Sheets :

BALANCE SHEET

(as on 31st December)

(Rs.'000)

Liabilities	*1992*	*1993*	*Assets*	*1992*	*1993*
Equity Capital	140	140	Fixed Assets (Net)	100	182
Mortgage Payable	—	80	Inventory	30	80
Retained Earnings	14	20	Sundry Debtors	10	40
Sundry Creditors	28	78	Prepaid Expenses	4	8
Tax Payable	2	6	Cash	40	14
	184	324		184	324

Other information for the year ended 1993 is as under :

	Rs. 000'
Sales	200
Cost of Goods Sold (1)	146
Expenses:	
General	22
Depreciation	16
Property tax	8
Dividends	2
Retained Earnings	6

X Ltd. carried out an expansion programme and had paid Rs. 18,000 cash and signed Rs. 80,000 mortgage on a new building.

Prepare a cash flow statement

(1) Opening stock	30
+ Purchases	196
	226
– Closing stock	80
	146

Solution :

CASH FLOW STATEMENT

(For the year ended 31st December 1993)

	Rs.'000		*Rs.'000*
Balance of Cash on 1-1-1993	40		
Add : Cash Inflows		*Outflows of Cash:*	
		Payment of Dividend	2
		Payment of Taxes	4
Increase in Sundry Creditors (78-28)	50	Purchase of Fixed Assets	98
		Increase in Inventory	

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Raising of Mortgage	80	(80-30)	50
Cash Operating Profit	36	Increase in Debtors (40-10)	30
		Prepaid Expenses of 1993	8
		Balance of Cash on 31-12-1993	14
	206		206

Workings :

(1) TAX PAYABLE ACCOUNT

	Rs'000		*Rs.'000*
To Cash Paid (balancing figure)	4	By Balance b/d	2
To balance c/d	6	By Adjusted P/L Account (Charged during the year)	8
	10		10

(2) FIXED ASSETS ACCOUNT

	Rs'000		*Rs.'000*
To Balance b/d	100	By Depreciation	16
To Cash - Purchased (balancing figure)	98	By Balance c/d	182
	198		198

(3) ADJUSTED PROFIT AND LOSS ACCOUNT

(Retained Earnings)

	Rs'000		*Rs.'000*
To Tax Payable	8	By Balance b/d	14
To Depreciation	16	By Cash Operating Profit	36
To Dividends	2		
To Prepaid Expenses (1992)	4		
To balance c/d	20		
	50		50

Problem 4.9. Following are the Balance Sheets of Good Limited :–

Liabilities	*1989*	*1990*	*Assets*	*1989*	*1990*
Equity Share Capital	1,00,000	1,42,000	Lands	24,000	48,000
7% Preference Share Capital	80,000	80,000	Building & Equipment	1,80,000	2,88,000
Profit &Loss Account	75,900	81,900	Debtors	84,000	84,000
Creditors	1,20,000	1,08,000	Inventory	1,32,000	48,000
Outstanding Expenses	12,000	24,000	Prepaid Rent	1,800	2,400
Provision for taxation	6,000	6,600	Prepaid Insurance	2,100	2,100
Provision for Depreciation	60,000	66,000	Cash	30,000	36,000
	4,53,900	5,08,500		4,53,900	5,08,500

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1. The company declared and paid equity dividend of Rs. 36,000 during the year 1990
2. The provision for taxation for 1990 is to be included in Creditors.
3. A truck costing Rs. 36,000 and with accumulated depreciation of Rs. 24,000 was sold at a profit of Rs. 600.

Prepare *(a)* Statement of Sources and Application of Funds for the year 1990 and *(b)* Cash Flow Statement.

Solution:

(a) **SCHEDULE OF CHANGES IN WORKING CAPITAL**

	1989 Rs.	*1990* Rs.	*Increase in W.C.* Rs.	*Decrease in W.C.* Rs.
Current Assets :				
Cash	30,000	36,000	6,000	—
Prepaid Insurance	2,100	2,100	—	—
Prepaid Rent	1,800	2,400	600	—
Inventory	1,32,000	48,000	—	84,000
Debtors	84,000	84,000	—	—
	2,49,900	1,72,500		
Current Liabilities :				
Provision for Taxation	6.000	6,600	—	600
Outstanding Expenses	12,000	24,000	—	12,000
Creditors	1,20,000	1,08,000	12,000	
	1,38,000	1,38,600		
Working Capital (C.A.-C.L.)	1,11,900	33,900		
Net Decrease in W.C.		78,000	78,000	
	1,11,900	1,11,900	96,600	96,600

STATEMENT OF SOURCES AND APPLICATION OF FUNDS

Sources	*Rs.*	*Application*	*Rs.*
Issue of Share Capital	42,000	Purchase of Land	24,000
Sale of Truck	12,600	Purchase of Buildings	1,44,000
Funds from Operations	71,400	and Equipments	
Net Decrease in W.C.	78,000	Payment of Dividend	36,000
	2,04,000		2,04,000

(1) EQUITY SHARE CAPITAL ACCOUNT

	Rs.		*Rs.*
To Balance c/d	1,42,000	By Balance b/d	1,00,000
		By Cash-Issue of share (balancing figure)	42,000
	1,42,000		1,42,000

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(2) PROVISION FOR DEPRECIATION ACCOUNT

	Rs.		Rs.
To Equipment Account (Depreciation on Truck sold)	24,000	By Balance b/d	60,000
To Balance c/d	66,000	By Adjusted P/L A/C (balncing figure)	30,000
	90,000		90,000

(3) LAND ACCOUNT

	Rs.		Rs.
To Balance b/d	24,000	By Balance c/d	48,000
"Cash –Purchased (balancing figure)	24,000		
	48,000		48,000

(4) BUILDINGS AND EQUIPMENT ACCOUNT

	Rs.		Rs.
To Balance b/d	1,80,000	By Cash (Sale)	12,600
To Adjusted P/L Account (Profit on Sale)	600	By Provision for A/c	24,000
To Cash-Purchased (balancing figure)	1,44,000	"Balance c/d	2,88,000
	3,24,600		3,24,600

(5) ADJUSTED PROFIT AND LOSS ACCOUNT

	Rs.		Rs.
To Provision for Depreciation	30,000	By Balance b/d	75,900
To Dividend paid	36,000	"Profit on sale of truck	600
to Balance c/d	81,900	"Funds from operations	71,400
	1,47,900		1,47,900

(b) CASH FLOW STATEMENT

	Rs.		Rs.
Cash Balance on 1-1-1990	30,000	*Outflows of Cash*	
Add: Sources of Cash Inflow:			
Sale of Truck	12,600	Purchase of Land	24,000
Issue of Share Capital	42,000	Purchase of Building and Equipment	1,44,000
Decrease in Inventory	84,000	Decrease in creditors	12,000
Cash Operating Profit	1,05,900	Prepaid Rent (1990)	2,400
		Payment of Outstanding Expenses (1989)	12,000
		Prepaid Insurance (1990)	2,100
		Payment of tax (1989-assumed to be paid)	6,000
		Payment of Dividend	36,000
		Closing Balance of Cash (31-12-1990)	36,000
	2,74,500		2,74,500

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Working Note :

Calculation of Cash Operating Profit

		Rs.
Closing Balancing of P/L A/c (1990)		81,900
Add: Non–cash and Non-operating items :		
Provision for Depreciation		30,000
Dividend paid & declared		36,000
Outstanding Expenses (1990)		24,000
Prepaid Rent (1989)		1,800
Prepaid Insurance (1989)		2,100
Provision for taxation		6,600
		1,82,400
Less : Opening Balance of P/L A/c:	75,900	
Profit on sale of truck	600	76,500
		1,05,900

Problem 4.10 The following are the summarised Balance Sheets of a Company as on 31st December, 1989 and 31st December, 1990 :

Liabilities	*1989*	*1990*	*Assets*	*1989*	*1990*
Share Capital	1,00,000	1,25,000	Land & Buildings	1,00,000	95,000
General Reserve	25,000	30,000	Machinery	75,000	85,500
Profit & Loss A/c	15,250	15,300	Stock	50,000	37,000
Bank Loan			Sundry Debtors	40,000	32,100
(Long-term)	35,000		Cash	250	300
Sundry Creditors	75,000	67,600	Bank	—	4,000
Provision for Taxation	15,000	17,500	goodwill	—	2,500
	2,65,250	2,55,400		2,65,250	2,55,400

Additional Information :

During the year ended 31st December, 1990 :

1. Dividend of Rs. 11,500 was paid.
2. Assets of another company were purchased for a consideration of Rs. 25,000 payable in shares. The following assets were purchased :

Stock Rs. 10,000, Machinery Rs. 15,000

3. Machinery was further purchased for Rs. 4,000.
4. Depreciation written off on machinery Rs. 6,000.
5. Income-tax provided during the year Rs. 16, 500.
6. Loss on sale of machinery Rs. 100 was written off to general reserve.

You are required to prepare a Cash Flow Statement.

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Solution :

CASH FLOW STATEMENT

	Rs.		Rs.
Balance of Cash and Bank (1–1–90)	250	*Outflow of Cash*	
Add :Sources of Cash Inflow:		Payment of Bank Loan	35,000
Issue of Share Capital	25,000	Decrease in Creditors (75,000-67,600)	7,400
Decrease in stocks (50,000-37,000)	13,000	Purchase of Machinery (~~15,000~~+4,000)	19,000
Decrease in Debtors (40,000-32,100)	7,900	Purchase (Increase) of Goodwill	1,500
Sale of Machinery	2,400	Payment of Dividend	11,500
Cash Operating Profit	44,150	Payment of Tax	14,000
		Closing Balance of Cash and Bank (31-12-1990) (4,000+300)	4,300
	92,700		92,700

Working Notes :

(1) LAND AND BUILDING ACCOUNT

	Rs.		Rs.
To Balance b/d	1,00,000	By Adjusted P/L A/c (Depreciation-balancing figure)	5,000
		By Balance c/d	95,000
	1,00,000		1,00,000

(2) MACHINERY ACCOUNT

	Rs.		Rs.
To Balance b/d	75,000	By Adjusted P/L A/c (Depreciation)	6,000
To Share Capital	15,000	By Cash-sale (balancing figure)	2,400
To Cash	4,000	By General Reserve (Loss)	100
		By Balance c/d	85,500
	94,000		94,000

(3) PROVISION FOR TAXATION ACCOUNT

	Rs.		Rs.
To Cash-taxes paid (balancing figure)	14,000	By Balance b/d	15,000
To Balance c/d	17,500	By Adjusted P/L A/c	16,500
	31,500		31,500

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(4) GENERAL RESERVE ACCOUNT

	Rs.		Rs.
To Machinery A/c		By Balance b/d	25,000
(Loss on sale)	100	By Adjusted P/L A/c	5,100
To Balance c/d	30,000	(balancing figure)	
	30,100		30,100

(5) ADJUSTED PROFIT AND LOSS ACCOUNT

	Rs.		Rs.
To General Reserve	5,100	By Balance b/d	15,250
To Provision for taxation	16,500	By Cash Operatign Profit	
To Dividend paid	11,500	(balancing figure)	44,150
To Depreciation on Machinery	6,000		
To Depreciation on Land & Buinding	5,000		
To Balance c/d	15,300		
	59,400		59,400

Problem 4.11. The following schedule shows the balance sheets in condensed form of Sanjeev Ltd. at the end of the year 1991:

Assets	*1.1-1991*	*31-12-1991*
	Rs.	Rs.
Cash and bank balances	45,000	45,000
Sundry Debtors	33,500	21,500
Temporatry Investments	55,000	37,000
Pre-paid Expenses	500	1,000
Stock-in-trade	41,000	53,000
Land & Buildings	75,000	75,000
Machinery	26,000	35,000
	2,76,000	2,67,500
Liabilities and Capital :		
Sundry Creditors	51,500	48,000
Outstanding Expenses	6,500	6,000
8% Debentures	45,000	35,000
Depreciation Fund	20,000	22,000
Reserve for Contingencies	30,000	30,000
Profit and Loss Account	8,000	11, 500
Capital	1,15,000	1,15,000
	2,76,000	2,67,500

The following information is also available :

1. 10% Dividend was paid in Cash.
2. New Machinery for Rs. 15,000 was purchased but old machinery costing Rs. 6,000 was sold for Rs. 2,000; accumulated depreciation was Rs. 3,000.

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3. Rs. 10,000 8% Debentures were redeemed by purchase from open market @ 96 for adebenture of Rs. 100.

4. Rs. 18,000 Investment were sold at book value. You are required to prepare Cash Flow Statement.

Solution :

CASH FLOW STATEMENT

(for the year ended 31-12-1991)

	Rs.		Rs.
Cash and Bank Balance on 1-1-1991	45,000	*Outflows of Cash :* Payment of Dividend	11,500
Sources of Cash Inflow :			
Sale of Machinery	2,000	Redemption of Debentures @ Rs. 96)	9,600
Sale of Investments	18,000	Purchase of Machinery	15,000
Decrease in Sundry Debtors	12,000	Increase in stock-in- trade	12,000
Operating Profit (including non-cash items)	27,100	Decrease in Sundry Creditors	3,500
		Prepaid Expenses (1991)	1,000
		Outstanding Expenses on 1=1=1991 assumed to be paid	6,500
		Balance of Cash and Bank on 31-12-1991	45,000
	1,04,100		1,04,100

Working Notes :

(1) MACHINERY ACCOUNT

	Rs.		Rs.
To Balance b/d	26,000	By Cash (sale)	2,000
To Cash Purchased	15,000	By Depreciation Fund	3,000
		By Adjusted P/L A/c	1,000
		By Balance c/d	35,000
	41,000		41,000

(2) DEPRECIATION FUND ACCOUNT

	Rs.		Rs.
To Machinery Account (Depreciation on machinery sold)	3,000	By Balance b/d	20,000
		By Adjusted P/L A/c (balancing figure)	5,000
To Balance c/d	22,000		
	25,000		25,000

(3) ADJUSTED PROFIT AND LOSS ACCOUNT

	Rs.		Rs.
To Loss on sale of Machinery	1,000	By Balance b/d	8,000
To Depreciation fund	5,000	By Profit on Redemption of Debentures (10,000-9,600)	400
To Dividend Paid	11,500	By Opewrating Profit	27,100
To Prepaid Expenses (on 1-1-1991)	500		
To Outstanding Expenses (on 31-12-1991)	6,000		
To Balance c/d	11,500		
	35,500		35,500

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Alternatively:

	Rs.	Rs.
Closing Balance of P/L A/c (on 31-12-1991)	11,500	
Add: Non- Cash and non-operating items which have been debited to P/L A/c:		
Loss of Sale of Machinery	1,000	
Depreciation Charged	5,000	
Dividend Paid	11,500	
Prepaid Expenses (1-1-1991) (being non-cash)	500	
Outstanding Expenses (31-12-91)	6,000	
		35,500
Less : Opening balance of P/L A/c and non-operating profits:		
Opening balance of P/L A/c	8,000	
Profit on Redemption of Debentures	400	
		8,400
Cash Operating Profit		27,100

Problem 4.12. From this following condensed Balance Sheets of X Company Ltd., for the years ending 31st December, 1988 and 31st December 1989, make out a cash flow statement for 1989:

Liabilities	*1988*	*1989*	*Assets*	*1988*	*1989*
	Rs.	Rs.		Rs.	Rs.
Share Capital-Equity	2,00,000	2,50,000	Goodwill	50,000	45,000
9% Preference Share Capital	60,000	40,000	Land and Building	80,000	55,000
Capital Reserve	—	10,000	Plant and Machinery	90,000	1,60,000
General Reserve	15,000	20,000	Furniture	12,000	10,000
P and L A/c	25,000	40,000	Trade Investments	10,000	45,000
Sundry Creditors	28,000	52,000	Sundry Debtors	32,000	25,000
Bills Payable	8,000	10,000	Stock	64,000	45,000
Outstanding Expenses	4,000	3,000	Bills Receivable	10,000	35,000
Proposed Dividend	18,000	25,000	Cash in hand	10,000	25,000
Provision for taxation	20,000	24,000	Cash at Bank	15,000	26,000
			Preliminery Expenses	5,000	3,000
	3,78,000	4,74,000		3,78,000	4,74,000

Additional Information :

1. An interim dividend of Rs. 10,000 has been paid in 1989.
2. Rs. 2,000 has been received as dividend on trade investments.
3. A piece of land has been sold out in 1989 and the remaining has been revalued, profit on sale and revaluation being transferred to Capital Reserve.

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4. Depreciation on Plan and machinery has been written off Rs. 15,000 in 1989, and no depreciation has been charged on land and building.

5. A machinery was sold for Rs. 18,000 (w.d.v being Rs. 20,000) and no furniture has been sold during the year 1989)

Solution :

CASH FLOW STATEMENT

(for the year ended 31-12-1989)

	Rs.		Rs.
Cash and Bank Balance as on 1-1-1989	25,000	*Outflows of cash:*	
Add Cash Inflows :		Payment of interim dividend	10,000
Dividend Received	2,000	Redemption of Preference Shares	20,000
Sale of Land	35,000	Purchase of Plant and Machinery	1,05,000
Sale of Machinery	18,000	Purchase of Investment	35,000
Issue of shares	50,000	Increase in Bills Receivables	25,000
Increase in Sundry Creditors	24,000	Payment of Proposed	
Increase in Bills Payabls	2,000	Dividend for 1988	
Decrease in Sundry Debtors	7,000	(assumed)	18,000
Decrease in Stock	19,000	Provision for Taxation for 1988	
Cash Operating Profit	1,06,000	(assumed to be paid)	20,000
		Outstanding Expenses	
		(for 1988)	4,000
		Cash and Bank Balance	
		on 31-12-1989	51,000
	2,88,000		2,88,000

Working Notes :

(1) PLANT AND MACHINERY ACCOUNT

	Rs.		Rs.
ToBalance b/d	90,000	By Cash	18,000
To Cash (purchase)		By Adjusted P/L A/c	2,000
(balancing figure)	1,05,000	(Loss on sale)	
		By Adjusted P/L A/c	15,000
		(Depreciation)	
		By Balance c/d	1,60,000
	1,95,000		1,95,000

(2) LAND AND BUILDINGS ACCOUNT

	Rs.		Rs.
To Balance b/d	80,000	By Cash (sale)	35,000
To Capital Reserve	10,000	(balancing figure)	
	–	By Balance c/d	55,000
	90,000		90,000

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(3) GOODWILL ACCOUNT

	Rs.		Rs.
To Balance b/d	50,000	By Adjusted P/L A/c (balancing figure)	5,000
		By Balance c/d	45,000
	50,000		50,000

(4) TRADE INVESTMENTS ACCOUNT

	Rs.		Rs.
To Balance b/d	10,000	By Balance c/d	45,000
To Cash (purchases) (balancing figutre)	35,000		
	45,000		45,000

(5) PROPOSED DIVIDEND ACCOUNT

	Rs.		Rs.
To Cash (Assumed paid)	18,000	By Balance b/d	18,000
To Balance c/d	25,000	By Adjusted P/L a/c (balancing figure)	25,000
	43,000		43,000

(6) GENERAL RESERVE ACCOUNT

	Rs.		Rs.
To Balance c/d	20,000	By Balance b/d	15,000
		By Adjusted P/L A/c (balancing figure)	5,000
	20,000		20,000

(7) PRELIMINERY EXPENSES ACCOUNT

	Rs.		Rs.
To Balance b/d	5,000	By Adjusted P/L A/c (balancing figure)	2,000
		By Balance c/d	3,000
	5,000		5,000

(8) PROVISION FOR TAXATION ACCOUNT

	Rs.		Rs.
To Cash (Assumed paid)	20,000	By Balance b/d	20,000
To Balance c/d	24,000	By Adjusted P/L A/c (balancing figure)	24,000
	44,000		44,000

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(9) FURNITURE ACCOUNT

	Rs.		*Rs.*
To Balance b/d	12,000	By Adjusted P/L A/c (balancing figure)	2,000
		By Balance c/d	10,000
	12,000		12,000

(10) ADJUSTED PROFIT AND LOSS ACCOUNT

	Rs.		*Rs.*
To Interim Dividend	10,000	By Opening Balance	25,000
To Proposed Dividend	25,000	By Dividend Received	2,000
To Provision for tax	24,000	By Cash Operating Profit (balancing figure)	1,06,000
To General Reserve	5,000		
To Goodwill	5,000		
To Depreciation on furniture	2,000		
To Depreciation on Plant & Machinery	15,000		
To Preliminery Expenses	2,000		
To Outstanding Expenses for 1989	3,000		
To Loss on Sale of machinery	2,000		
To Balance c/d (Closing Balance)	40,000		
	1,33,000		1,33,000

Problem 4.13 Parveen & Co. has statements of financial position as at 31st December 1989 and 31st December, 1990 as follows :

	31-12-1989	*31-12-1990*
	Rs.	*Rs.*
Accounts Payable	7,500	3,500
Owners' Equity	5,24,500	5,13,500
	5,32,000	5,17,000
Cash	20,000	35,000
Accounts Receivable	30,000	25,000
Supplies	12,000	7,000
Equipment (Net)	70,000	65,000
Building (Net)	4,00,000	3,85,000
	5,32,000	5,17,000

Assume that the company made a sale of Rs. 19,75,000 during the year, that no withdrawals were made by the owners and that no changes took place affecting equipment and building except for depreciation in 1990. You are required to prepare from the above information, a funds statement for cash changes.

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Solution :

CASH FLOW STATEMENT

(for the year ended 31-12-1990)

	Rs.		Rs.
Cash Balance on 1-1-1990	20,000	*Cash Outflows :* Decrease in Accounts Payable	4,000
Add: Cash Inflows :			
Decrease in Accounts Receivables	5,000	Cash balance on	
Decrease in Supplies	5,000	31-12-1990	35,000
Cash Operating Profit	9,000		
	39,000		39,000

Working Notes :

Cash Operating Profit :

The comparison of capital in the beginning and at the end of the year reveals that it has been reduced by Rs. 11,000 (5,24,500-5,13, 500). As there are no withdrawals, it should be due to the loss during the year.

	Rs.
Loss: during the year	- 11, 000
Add : Non-cash/operating items :	
Deperciation on Equipment	+ 5,000
Depreciation on Building	+ 15,000
Cash Operating Profit	9,000

Alternative Solution

CASH FLOW STATEMENT

	Rs.			Rs.
Cash Balance on 1-1-1990	20,000	*Cash outflow :* Expenses during the year	19,86,000	
Add : Cash Inflows:				
Sales	19,75,000	*Less :* Depreciation		
Collection form Account Receivables	5,000	on Equipment		
Sale of Supplies	5,000	and building being		
		non-Cash	20,000	19,66,000
		Decrease in Accounts Payable		4,000
		Balance of Cash on 31-12-1990		35,000
	20,05,000			20,05,000

* Expenses during the year have been calculated as under :

Sales during the year	19,75,000
Loss during the year (5,24,500-5,13,500)	11,000
Expenses during the year	19,86,000

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Problem 4.14. Harish Ltd. had the following figures in Ist January, 1994:

	Rs.
Fixed Assets	3,00,000
Less : Depreciation	1,05,000
	1,95,000
Bank Balance	17,500
Other Current Assets	1,25,000
Capital (Shares of Rs. 10 each)	1,50,000
Current Liabilities	50,000

The company made the following estimates for 1994 :

(a) The Profit would be Rs. 27,500 after depreciation of Rs. 30,000.

(b) The company will acquire fixed assets costing Rs. 50,000 after selling one machine for Rs. 10,000 costing Rs. 25,000 and on which depreciation provided amounts to Rs. 17,500.

(c) Current assets and current liabilities other than bank balance at the end of 1994 are expected to be Rs. 1,47,500 and Rs. 1,15,000 respectively.

(d) The Company will pay free of tax dividend at 10%, the rate of tax being 25%.

You are required to prepare Cash Flow Statement and ascertain the bank balance of Harish Ltd. as on 31st December, 1994.

Solution :

CASH FLOW STATEMENT

(for the year ended 31st December 1994)

	Rs.		*Rs.*
Bank Balance on 1-1-1994	17,500	*Outflows of Cash*	
Add: Cash Inflows:		Purchase of Fixed Assets	50,000
Sale of Machinery	10,000	Payment of Dividend	15,000
Increase in Current Liabilities (1,15,000-50,000)	65,000	Payment of Tax on above[1] (25% of gross)	5,000
Cash Operating Profit	55,000	Increase in Currnet Assets other than Bank	22,500
Bank Balance on 31-12-1994 (balancing figure).			55,000
	1,47,500		1,47,500

Working Notes :

(1) Payment of Dividend = 10% of Rs. 1,50,000
(Tax Free) = Rs. 15,000
(Rate of Tax = 25%.

If Gross Dividend is Rs. 100, Tax is Rs. 25 and the Net Dividend shall be Rs.75. So, when Rs. 75 is paid as dividend, Tax is Rs. 25 and when Rs. 15,000 is paid as dividend,

$$\text{Tax} = 15{,}000 \times \frac{25}{75} \text{ Rs. } 5{,}000$$

(2) *Cash Operating Profit*

	Rs.
Profit (as given)	27,500
Add : Depreciation	30,000
	57,500

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Less: Profit on sale of machinery	2,500
	55,000

	Rs.
(3) *Profit on Sale of machinery :*	
Cost of Machinery sold	25,000
Less : Depreciation	17,500
Written down value	7,500
Sales value	10,000
Profit	2,500

Problem 4.15. From the following information you are required to prepare a Cash Flow Statement of C.P. Ltd. Stores for the year ended 31st December , 1994.

BALANCE SHEET

Liabilities :	*1993*	*1994*	*Assets*	*1993*	*1994*
	Rs.	*Rs.*		*Rs.*	*Rs.*
Share Capital	70,000	70,000	Plant & Machinery	50,000	91,000
Secured Loans (Repayable in 1999)	—	40,000	Inventory	15,000	40,000
			Debtors	5,000	20,000
Creditors	14,000	39,000	Cash	20,000	7,000
Tax Payable	1,000	3,000	Prepaid Capital Expenses	2,000	4,000
P & L A/c	7,000	10,000			
	92,000	1,62,000		92,000	1,62,000

PROFIT AND LOSS ACCOUNT

(for the year ended 31st December, 1994)

	Rs.		*Rs.*
To Opening inventory	15,000	By Closing Stock	40,000
To Purchases	98,000	By Sales	1,00,000
To Gross Profit c/d	27,000		
	1,40,000		1,40,000
To General Exp.	11,000	By Gross Profit b/d	27,000
To Depreciation	8,000		
To Taxes	4,000		
To Net Profit c/d	4,000		
	27,000		27,00
To Dividend	1,000	By Balance b/f	7,000
To Balance c/f	10,000	By Net Balance b/d	4,000
	11,000		11,000

Solution :

CASH FLOW STATEMENT

(for the year ended 31st December 1994)

	Rs.		*Rs.*
Opening Balance of Cash on 1-1-1994	20,000	*Outflow of cash* : Purchase of Plant and Machinery	49,000
Add: Cash Inflow : Raising of Secured Loans	40,000	Payment of Dividend	1,000

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Increase in Creditors	25,000	Payment of Taxes	2,000
Cash Operating Profit	18,000	Increase in Inventory (40,000-15,000)	25,000
		Increase in Debtors (20,000-5,000)	15,000
		Prepaid Expenses (Assumed paid -1994)	4,000
		Balance Cash on 31-12-1994	7,000
	1,03,000		1,03,000

Working Notes :

(1) TAX PAYABLE ACCOUNT

	Rs.		Rs.
		By Balance b/d	1,000
To Cash –Paid (balancing figure)	2,000	By Adjusted P/L A/c (Taxes Charged during the year)	4,000
To Balance c/d	3,000		
	5,000		5,000

(2) PLANT AND MACHINERY ACCOUNT

	Rs.		Rs.
To Balance b/d	50,000	By Depreciation	8,000
To Cash-Purchased (balancing figure)	49,000	By Balance c/d	91,000
	99,000		99,000

(3) ADJUSTED PROFIT AND LOSS ACCOUNT

	Rs.		Rs.
To Dividend	1,000	By Balance b/d	7,000
To Taxes Payable	4,000	By Cash Operating Profit	18,000
To Depreciation	8,000		
To Prepaid Expenses of 1993 being non-cash	2,000		
To Balance c/d	10,000		
	25,000		25,000

Problem 4.16. The balance Sheet Of X Co. Ltd. as at 31st December, 1988 and 31st December, 1989 are as follows :

	(Rs. in lacs) 1988	1989		(Rs. in lacs) 1988	1989
Share Capital	300.00	300.00	Property at cost	225.00	240.00
Reserves	225.00	240.00	Plant & Machniery (w.d.v)	135.00	165.00
6%Debentures	75.00	75.00	Investments in companies under the same management (unquoted)	150.00	150.00
Mortgage on property	27.00	14.25	Other Investment	112.50	112.50
Creditors	45.00	45.00	Market value:		
Proposed Dividend (subject to deduction of tax)	22.50	23.25	1988 = 150 lacs		
Provision for tax	21.00	37.50	1989 = 120 lacs		
Secured overdraft (by a floating charge)	15.00	82.50	Stock	52.50	75.00
			Debtors	45.00	75.00
			Bank	10.50	—
	730.50	817.50		730.50	817.50

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The following additional information for the year 1989 is relevant :

		(Rs. in lacs)
(i)	Credit Sales	675
(ii)	Credit Purchases	520
(iii)	Overheads	83.75
(iv)	Depreciation on Plant	17.50
(v)	Amount paid towards Taxation for 1989	21.50

In view of the credit squeeze, the company has been asked by the Bank to reduce its credit substantially within six months, if possible by 50%.

You are required to prepare a Cash Flow Statement.

Solution :

CASH FLOW STATEMENT

(for the year ended 31st December 1989)

	Rs. in lacs		*Rs. in lacs*
Cash inflows :		Overdraft (Net)	
Cash Operating Profit	93.75	on 1-1-1989	
Overdraft as on		(15-00-10.50)	4.50
31-12-1989	82.50	*Outflows of Cash :*	
		Payment of Mortage	
		on property (27.00-14.25)	12.75
		Payment of Dividend for 1988	22.50
		Payment of Tax	21.50
		Purchase of Property (240.00-225.00)	15.00
		Purchase of Plant and Machinery	47.50
		Increase in Stocks (75.00-52.50)	22.50
		Increase in Debtors (75.00-45.00)	30.00
	176.25		176.25

Working Notes :

(1) PLANT AND MACHINERY ACCOUNT

	Rs. in lacks		*Rs.in lacs*
To Balance b/d	135.00	By Depreciation	
To Cash -Purchased		(Adjusted P/L A/C	17.50
(balancing figure)	47.50	By Balance c/d	165.00
	182.50		182.50

(2) PROVISION FOR TAX ACCOUNT

	Rs. in (lacs)		*Rs. in (lacs)*
To Proposed Dividend (1989)	21.50	By Balance b/d	21.00
To Balance c/d	37.50	By Adjusted P/L A/c	
		(balancing figure)	38.00
	59.00		59.00

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(3) ADJUSTED PROFIT AND LOSS ACCOUNT (RESERVES ACCOUNT)

	Rs. in (lacs)		*Rs. in (lacs)*
To Proposed Dividend (1989)	23.25	By Balance b/d (Reserves)	225.00
To Provision for Tax	38.00	By Cash -Operating profit	93.75
To Depreciation	17.50		
To Balance c/d	240.00		
	318.75		318.75

Problem 4.17 Prepare a Cash Flow Statement for 1992 from the following information :

Income Statement for 1992

Sales		10,00,000
Cost of Sales (including depreciation Rs. 10,000)		7,50,000
		2,50,000
Less :	*Rs.*	
Selling and Administrative Expenses...	50,000	
Other Expenses	25,000	
Interest on loans	5,000	80,000
Gross Profit		1,70,000

Balance Sheet

Assets:	1991	1992
Cash in hand and at bank	75,000	65,000
Investments	25,000	75,000
Debtors	2,00,000	1,50,000
Stock	3,25,000	4,00,000
Plant and Equipment	12,50,000	14,90,000
	18, 75,000	21,80,000
Liabilities :		
Creditors	2,75,000	2,25,000
Outstanding creditors for Administrative and Selling expenses	25,000	10,000
Provision for depreciation	40,000	50,000
Loans	75,000	1,25,000
Share Capital	8,60,000	10,00,000
Reserve	6,00,000	7,70,000
	18,75,000	21,80,000

Solution :

CASH FLOW STATEMENT

(for the year ended 1992)

	Rs.	*Cash outflows*	*Rs.*
Opening Balance of cash in hand and at bank	75,000	Purchase of investments (75,000-25,000)	50,000
Add: Cash and inflows:		Increase in stock	75,000
Issue of share Capital (10,00,000-8,60,000)	1,40,000	(4,00,000-3,25,000)	
		Decrease in Creditors	50,000
Raising of Loans		(2,75,000-2,25,000)	

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(1,25,000-75,000)		Payment of Outstanding	
Decrease in Debtors	50,000	Expenses for 1991	25,000
(2,00,000-1,50,000)	50,000	Purchase of Plant and Equipment	
Cash Operating Profit (1)	1,95,000	(14,90,000-12,50,000)	2,40,000
		Payment of Interest on Loan	5,000
		Closing Balance of Cash in hand and at bank	65,000
	5,10,000		5,10,000

Working Notes :

Calculation of Cash Operating Profit :

Closing Balance of Reserves	7,70,000
Add Non-cash/non-operating items :	
Provision for depreciation	10,000
Outstanding expenses for 1992	10,000
Interest on Loan	5,000
	7,95,000
Less : Opening Balance of Reserves	6,00,000
Cash Operating Profit	1,95,000

Problem 4.18 The Balance Sheets of M/s Amit Traders are submitted as follows :

	('000 omitted)			('000 omitted)	
	1991	1990		1991.	1990
Current Assets :					
Cash	2	10	Current Liabilities	105	30
Account Receivable	60	30	Long term Debt	150	—
Inventories	100	50	Capital	207	160
Total Current assets	162	90			
Fixed Assets (Net)	300	100			
Total Assets	462	190	Total Equities	462	190

Notes. Drawings during 1991 amounted to Rs. 7,000. Depreciation charged was Rs. 20,000. Fixed Assets were purchased for Rs. 2,20,000, Rs. 1,50,000 of which was financed via the issuance of long-debt and the balance for cash.

Mr. Amit who had little patience with the financial matters muttered."We have enjoyed ten years of steady growth; 1991 was our most profitable year. Despite such profitability, we are in the worst cash position in our history. Just look at those current liabilities in relation to our available cash! This whole picture of the more you make, the poorer you get just does not make sense. These statements must be cockneyed."

Prepare the Cash Flow Statement to explain the position of cash.

Solution :

CASH FLOW STATEMENT *(Rs. in thousands)*

	Amount	*Outflows of Cash*	*Amount*
Balance of Cash on 1-1-1991	10	Increase in Accounts Receivable	30
Add:Cash Inflows:		Increase in Inventories	50
Increase in Current Liabitlities	75	Purchase of Fixed Assets	220
Increase in long-term debt	150	Drawings	7
Cash operating Profit (1)	74	Balance of Cash on 31-12-1991	2
	309		309

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Working Notes:

Calculation of Cash Operating Profit

	(Rs.'000)
Capital on 31-12-1991	207
Add : Drawings	7
	214
Less : Capital balance on 1-1-1991	160
Profit made in 1991	54
Add Depreciation charged in 1991 being non-cash item	20
Cash Operating Profit	74

Problem 4.19. The following are the Balance Sheets of Paploo Ltd.:

(Rs. in thousands)

Liabilities	*1988*	*1989*	*Assets*	*1988*	*1989*
Equity Capital	3,000	4,000	Property	2,000	2,500
Share Premium	—	100	Plant & Machinery	4,000	4,500
P&L Account			*Less:* Depreciation	(1,400)	(1,500)
Balance	1,000	1,000	Loan to Subsidiary	—	150
Profit for the year		2,000	Shares in Subsidiary	200	200
6% Debentures	1,500	1,000			
Profit on Redemption of Debentures	—	20	Stock	1,400	1,500
Sundry Creditors	1,400	1,100	Debtors	1,000	1,500
Provision for tax	500	1,000	Bank	350	1,570
Proposed Dividend	150	200			
	7,550	10,420		7,550	10,420

Additional Information :

In 1989 Plant and Machinery costing Rs. 5 lakhs (accumulated depreciation Rs. 3 lakhs) was sold for Rs. 1 lakh. Taxes paid for the last year Rs. 6 lakhs.

Prepare Cash Flow Statement.

Solution :

CASH FLOW STATEMENT

(Rs. in '000s)

Bank Balance on 1-1-89	350	*Outflows of Cash :*	
Add:Cash Inflows:		Redemption of Debentures (1500-1,020)	480
Issue of Shares (including premium)	1100	Purchase of Plant and Machinery (1)	1,000
Sale of Plant & Machinery	100		
Cash Operating Profit (2)	3,800	Purchase of Property	500
		Loan to Subsidiary	150
		Increase in Stock	100
		Increase in Debtors	500
		Reduction in Creditors	300
		Payment of Taxes	600
		Payment of Dividend (1988) (assumed to be paid)	150
		Balance on 31-12-89	1,570
	5,350		5,350

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Working Notes :

		Rs.
(1)	*Purchase of Plant:*	
	Opening Balance (at cost)	4,000
	Less : Cost of Plant Sold	500
		3,500
	Closing Balance	4,500
	Purchased during the year	1,000
(2)	*Cash Operating Profit :*	
	Profit for the year (given)	2,000
	*Add:*Non/cash/non-operating items:	
	Proposed Dividend	200
	Provision for Tax (3)	1,100
	Depreciation of Plant & Machinery (4)	400
	Loss on Sale of Plant	100
		3,800
(3)	*Provision for Tax :*	
	Taxes Paid	600
	*Less :*Opening Balance	500
		100
	Closing Balance	1,000
	Provision created during the year	1,100
(4)	*Depreciation on Plant & machinery*	
	Opening Balance	1,400
	*Less :*Depreciation on Sold Plant	300
		1,100
	Closing Balance	1,500
	Depreciation charged during the year	400

Problem 4.29. The directors of Precision Tools Ltd., are worried at the deteriorating financial position of the company. The company has utilised full overdraft facility from bank and still it is not able to pay its creditors on due dates, although the profits earned are satisfactory.

The following are the balance sheets as at 31st December 1991 and 1992:

		Dec.31,1991		*Dec.31,1992*
		Rs.		*Rs.*
Share Capital		10,00,000		10,00,000
Profit and Loss Account		60,000		80,000
Overdraft from bank		1,60,000		6,00,000
Sundry Creditors		2,00,000		6,00,000
		14,20,000		22,80,000
Land and Buildings		3,00,000		5,00,000
Plant & Machinery	5,00,000		6,00,000	
*Less:*Depreciation	1,20,000		1,80,000	
		3,80,000		4,20,000
Vehicles	1,16,000		1,24,000	
	56,000		84,000	
		60,000		40,000
Stock		2,20,000		7,20,000
Debtors		4,60,000		6,00,000
		14,20,000		22,80,000

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During the year a dividend of 10% was distributed to the shareholders. On 1st January 1992 a motor car which originally cost Rs. 20,000 and showing book value of Rs. 10,000 was sold for Rs. 16,000. You are required to prepare a statement which will show as to what has happened to the money which has come into the business during the year.

Solution :

CASH FLOW STATEMENT

(for the ended 31 December 1992)

	Rs.		Rs.
Inflows of Cash		Bank Overdraft on 1-1-1992	1,60,000
Sale of Car	16,000	*Outflows of Cash:*	
Increase in Creditors		Purchase of Land and Building	
(6,00,000-2,00,000)	4,00,000	(5,00,000-3,00,000)	2,00,000
Cash Operating Profit	2,12,000	Purchase of Plant and	
		Machinery (6,00,000-5,00,000)	1,00,000
Bank Overdraft on 31-12-1992	6,00,000		
		Purchase of Vehicles	28,000
		Increase in Stocks	
		(7,20,000-2,20,000)	5,00,000
		Increase in Debtors	
		(6,00,000-4,60,000)	1,40,000
		Payment of Dividend	1,00,000
	12,28,000		12,28,000

Working Notes :

(1) VEHICLES ACCOUNT

To Balance b/d	1,16,000	By Cash (sale)	16,000
To Adjusted P/L A/c		By Accumulated Depreciation	10,000
Profit on Sale (26,000-20,000)	6,000	By Balance c/d	1,24,000
To Cash-Purchased	28,000	(balancing figure)	
	1,50,000		1,50,000

(2) ACCUMULATED DEPRECIATION ACCOUNT

(vehicles)

	Rs.		Rs.
To Vehicles Account (on sold)	10,000	By Balance b/d	56,000
To Balance c/d	84,000	By Adjusted P/L A/c	38,000
		(balancing figure)	
	94,000		94,000

(3) ADJUSTED P/L A/C

	Rs.		Rs.
To Depreciation on Vehicles	38,000	By Balance b/d	60,000
To Plant and Machinery		By Profit on sale of car	6,000
(1,80,000-1,20,000)	60,000	By Cash operating Profit	
To Dividend paid	1,00,000	(balancing figure)	2,12,000
To Balance c/d	80,000		
	2,78,000		2,78,000

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Problem 4.21. The following are the Balance Sheets of DAVNCOM Enterprises

Liabilities	*1993* Rs.	*1994* Rs.	*Assets*	*1993* Rs.	*1994* Rs.
Capital	1,50,000	1,60,000	Cash	5,000	8,000
Hire Purchase Vendor		20,000	Debtors	35,000	38,000
Loan from bank	30,000	25,000	Stock	25,000	22,000
Current Liabilities	35,000	40,000	Land	20,000	30,000
Mrs. D's Loan	—	20,000	Buildings	50,000	55,000
			Machinery		
			Less Depreciation	80,000	87,000
			Delivery Van	—	25,000
	2,15,000	2,65,000		2,15,000	2,65,000

The delivery Van was purchased on hire purchase basis in December, 1994; a payment of Rs. 5,000 was made at the time of agreement and the balance of amount is to be paid in 20 monthly instalments of Rs. 1,000 each together with interest @ 10% p.a. During the year the proprietor withdrew Rs. 25,000 for household expenses. The provision for depreciation on machinery on 1-1-94 was Rs. 27,000 and on 31-12-94 was Rs. 35,000. You are required to prepare Cash Flow Statement.

Solution :

CASH FLOW STATEMENT

(for the year ended 31-12-1994)

	Rs.	Rs.	
Balance of cash on 1-1-1994	5,000	*Outflows of cash :*	
Add :Cash Inflows		Increase in Debtors	
Loan from Mrs. D	20,000	(38,000=35,000)	3,000
Increase in Current Liabilities		Purchase of Land	
(40,000-35,000)	5,000	(30,000-20,000)	10,000
Decrease in stock		Purchase of Building	
(25,000-22,000)	3,000	(55,000-50,000)	5,000
Credit from Hire Purchase		Purchase of Machinery	15,000
Vendor (notional Cash)	20,000	Purchase of Delivery Van	25,000
Cash Operating Profit	43,000	Repayment of Bank Loan	5,000
		Drawings	25,000
		Balance of Cash on 31-12-1994	8,000
	96,000		96,000

Working Notes :

(1) *Depreciation on Machinery*

	Rs.
Provision for Dep. 31-12-94	35,000
Provision for Dep. 1.1.94	27,000
Depreciation charged during the year	8,000

(2) *Calculation of Cash Operating Profit*

	Rs.
Capital on 31-12-1994	1,60,000
Less :Capital on 1-1-94	1,50,000
	10,000
Add: Drawings	25,000
Depreciation	8,000
Cash Operating Profit	43,000

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Problem 4.22. Prepare a Cash Flow Statement of Atlantic Business Corporation from the following information :

BALANCE SHEET

as at Jan., 1 and December 31,1994

	January 1,	*December, 31*
	Rs.	*Rs.*
Cash and Bank	40,000	44,400
Accounts Receivable	10,000	20,700
Inventories	15,000	15,000
Land	4,000	4,000
Business Premises	20,000	16,000
Plant and Equipment	15,000	17,000
Accumulated Depreciation	(5,000)	(2,800)
Patents and Trade marks	1,000	900
Total Assets	1,00,000	1,15,200
Current Liabilities	30,000	32,000
Bonds payable	22,000	22,000
Bonds Payable Discount	(2,000)	(1,800)
Capital Stock	35,000	43,500
Retained Earnings	15,000	19,500
Total Liabilities	1,00,000	1,15,200

Additional Information :

(i) Income for the period Rs. 10,000.

(ii) A building that costs Rs. 4,000 and which had a book value of Rs. 1,000 was sold for Rs. 1,400.

(iii) The Depreciation charged for the year was Rs. 800.

(iv) There was a Rs. 5,000 issue of Capital stock.

(v) Cash dividend of Rs. 2,000 and a stock dividend of Rs. 3,500 were declared.

Solution :

CASH FLOW STATEMENT

(for the ended 31-12-1994)

	Rs.		*Rs.*
Cash and Bank Balance on 1-1-1994	40,000	*Outflow of Cash:* Payment of Cash Dividend	2,000
Add: Cash Inflows :		Increase in Accounts Receivable (20,700-10,000)	10,700
Increase in Current Liabilities (32,000-30,000)	2,000	Purchase of Plant and Equipment	2,000
Issue of Capital	5,000	Balance of Cash and Bank on 31-12-1994	44,400
Sale of Building	1,400		
Cash Operating Profit	10,700		
	59,100		59,100

Working Notes :

(1) **BUSINESS PREMISES ACCOUNT**

	Rs.		*Rs.*
To Balance b/d	20,000	By Cash (sale)	1,400
To Adjusted P/L A/c (profit on Sale)	400	By Accumulated Depreciation A/c	3,000
		By Balance c/d	16,000
	20,400		20,400

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(2) PLANT AND EQUIPMENT ACCOUNT

	Rs.		Rs.
To Balance b/d	15,000	By Balance c/d	17,000
To Cash-Purchased (Balancing figure)	2,000		
	17,000		17, 000

(3) ACCUMULATED DEPRECIATION ACCOUNT

	Rs.		Rs.
To Business Premises A/c	3,000	By Balance b/d	5,000
To Balance c/d	2,800	By Adjusted P/L Account	800
	5,800		5,800

(4) PATENTS AND TRADE MARKS

	Rs.		Rs.
To Balance b/d	1,000	By Adjusted P/L Account (balancing figure)	100
		By Balance c/d	900
	1,000		1, 000

(5) BONDS PAYABLE DISCOUNT ACCOUNT

	Rs.		Rs.
To Balance b/d	2,000	By Adjusted P/L Account (balancing figure)	200
		By Balance c/d	1,800
	2,000		2, 000

(6) ADJUSTED PROFIT AND LOSS ACCOUNT

(Retained Earnings)

	Rs.		Rs.
To Depreciation Account	800	By Balance b/d	15,000
To Patents written off	100	By Profit on Sale of Building	400
To Discount written off	200	By Cash Operating Profit	10,700
To Dividend :			
Cash	2,000		
Stock	3,500		
To Balance c/d	19,500		
	26,100		26,100

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Problem 4.23. The abridged Profit & Loss Account for the years ended June 30,1990 and 1991 and the Balance sheets as on these dates of Beeches Ltd. were :

	1990		*1991*
	Rs.		*Rs.*
Trading Profit.	4,50,000		7,00,000
Profit on Sale of Investments	—		20,000
	4,50,000		7,20,000
Tax on Profits of the year	2,77,000		4,50,000
	1,73,000		2,70,000
Brought forward from previous year	1,50,000	1,73,000	
Income Tax over provided in previous years	—	40,000	2,13,000
	3,23,000		4,83,000
Proposed dividends	1,50,000	1,50,000	
Transfer to Gen. Reserve	—	1,00,000	2,50,000
Balance of undistributed Profit	1,73,000		2,33,000

BALANCE SHEETS

A. *Fixed Assets :*	*Rs.*			
Cost	5,00,000		6,00,000	
Addition	1,00,000	6,00,000	80,000	6,80,000
Depreciation		2,00,000		3,20,000
		4,00,000		3,60,000
B. *Current Assets :*				
Investments		1,20,000		—
Stocks at cost		17,80,000		20,00,000
Debtors		13,00,000		21,85,000
		32,00,000		41,85,000
Current Liabilities				
Bank Overdraft		11,50, 000		14,00,000
Trade Creditors.		7,00,000		9,00,000
Expenses Creditors		80,000		92,000
Current Taxation		1,97,000		3,00,000
Proposed dividend		1,50,000		1,50,000
		22,77,000		22,77,000
Net Current Assets:		9,23,000		13,43,000
Total (A+B)		13,23,000		17,03,000
Ordinary Share Capital		7,00,000		8,00,000
General Reserve		2,50,000		3,50,000
Profit & Loss Account		1,73,000		2,33,000
Future Taxation		2,00,000		3,20,000
		13,23,000		17,03,000

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For the year ended 30th June 1991 trading purchases totalled Rs. 65,00,000 and Sales Rs. 80,00,000; the trading profit was arrived at after charging depreciation, Rs. 1,20,000. Prepare a Cash Flow Statement of Beeches Ltd.

(C.A (Final) England]

Solution :

CASH FLOW STATEMENT OF BEECHES LTD.

(for the year ended 30-6-1991

	Rs.		Rs.
Cash Inflows:			
Sale of Investments	1,40,000	Bank Overdraft as on 1-7-1990	11,50,000
Increase in Trade Creditors (9,00,000-7,00,000)	2,00,000	*Outflows of Cash:* Purchase of Fixed Assets	80,000
Issue of Share Capital (8,00,000-7,00,000)	1,00,000	Increase in Stock (20,00,000-17,80,000)	2,20,000
Cash Operating Profit	9,12,000	Increase in Debtors (21,85,000-13,00,000)	8,85,000
Bank Overdraft as on 30-6-1991	14,00,000	Payment of Expenses Creditors for 1980 (assumed paid)	80,000
		Payment of Tax	1,87,000
		Payment of Dividend (for 1990 assumed)	1,50,000
	27,52,000		27,52,000

Working Notes :

(1) *Calculation of Sale of Investments:*

	Rs.
Cost of Investment sold	1,20,000
Add: Profit on sale of investments	20,000
Sales value	1,40,000

(2) *Payment of Tax:*

		Rs.
Balance (1990)		1,97,000
Add: Provision made during 1991		4,50,000
		6,47,000
Less: Excess Provision written back	40,000	
Increase in Future Tax (3,20,000-2,00,000)	1,20,000	
Balance of Provision (1991)	3,00,000	
		4,60,000
Taxes paid during the year		1,87,000

(3) *Calculation of Cash Operating Profit:*

	Rs.
Closing Balance of P/L A/c	2,33,000
Add: Non-Cash/Non-operating items which have been debited to P/L Account :	

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	Transfer to General Reserve		1,00,000
	Proposed Dividend		1,50,000
	Provision for Tax		4,50,000
	Expenses Creditors for 1991 (outstanding)		92,000
	Provision for Depreciation		1,20,000
			11,45,000
Less :	Opening Balance of P/L Account :	1,73,000	
	Income-Tax Over-Provided in previous year	40,000	
	Profit on sale of investments	20,000	
			2,33,000
	Cash Operating Profit		9,12,000

Prbolem 4.24. Prepare a Cash Flow Statement for 1994 from the following information.

Income Statement for 1994 :

			Rs.
	Sales		2,00,000
	Less: Cost of sales (including Rs. 2,000 depreciation)		1,50,000
	Gross Profit		50,000
	Less:		
	Selling and Administrative Expenses	10,000	
	Interest on Loan	1,000	
	Other Expenses	5,000	
			16,000
	Net Profit		34,000

BALANCE SHEETS

	1993	*1994*
	Rs.	*Rs.*
Assets :		
Cash in hand and at Bank	15,000	13,000
Investments	5,000	15,000
Debtors	40,000	30,000
Stock	65,000	80,000
Plant & Machinery	2,50,000	2,98,000
	3,75,000	4,36,000
Liabilities:		
	Rs.	*Rs.*
Creditors	55,000	45,000
Outstanding Expenses (Selling & Adm.)	5,000	2,000
Accumulated Depreciation	8,000	10,000

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Loans	15,000	25,000
Share Capital	1,72,000	2,00,000
Reserves	1,20,000	1,54,000
	3,75,000	4,36,000

Solution:

CASH FLOW STATEMENT FOR 1994

	Rs.		Rs.
Balance of Cash and Bank on 1-1-1994	15,000	*Outflow of Cash:*	
Add: Cash Inflows :		Purchase of Investments (15,000-5,000)	10,000
Decrease in Debtors (40,000-30,000)	10,000	Increase in stocks (80,000-65,000)	15,000
Raising of Loans (25,000-15,000)	10,000	Purchase of Plant and Machinery (2,98,000-2,50,000)	48,000
Issue of Capital (2,00,000–1,72,000)	28,000	Decrease in Creditors (55,000-45,000)	10,000
Cash Operating Profit	38,000	Payment of Outstanding Expenses for 1993 (assumed)	5,000
		Balance of Cash and Bank on 31-12-1994	13,000
	1,01,000		1,01,000

Working Notes:

Calculation of Cash Operating Profit

	Rs.
Net Profit as given	34,000
Add: Non/cash/Non-operating items:	
Depreciation (10,000-8,000)	2,000
Outstanding Expenses for 1994	2,000
	38,000

ADJUSTED P/L A/c

(Alternatively)

	Rs.		Rs.
To Depreciation	2,000	By Balance b/d	1,20,000
To Outstanding Exp.(1984)	2,000	By Cash Operating Profit	38,000
To Balance c/d	1,54,000		
	1,58,000		1,58,000

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Alternative Solution (ii)

CASH FLOW STATEMENT FOR 1994

	Rs.		Rs.
Cash and Bank Balance on 1-1-1994	15,000	*Outflows of Cash :*	
Add: Cash Inflows		Purchase of Investments	10,000
Raising of Loans	10,000	Purchase of Plant	48,000
Issue of Capital	28,000	Payment of Suppliers	1,73,000
Receipts from Customers	2,10,000	Payment of Other Expenses	5,000
		Payment of Selling Expenses	13,000
		Interest on Loan	1,000
		Balance of Cash & Bank on 31-12-1994	13,000
	2,63,000		2,63,000

Working Notes :

(1) Calculation of Purchases

	Rs.
Cost of sales (incld. Dep.)	1,50,000
Less : depreciation	2,000
	1,48,000
Add: Closing Stock	80,000
	2,28,000
Less: Opening Stock	65,000
Purchases	1,63,000

(2) SUNDRY CREDITORS ACCOUNT

	Rs.		Rs.
To Cash (balancing figure)	1,73,000	By Balance b/d	55,000
To Balance c/d	45,000	By Purchases (1)	1,63,000
	2,18,000		2,18,000

(3) SUNDRY DEBTORS ACCOUNT

	Rs.		Rs.
To Balance b/d	40,000	By Cash (balancing figure)	2,10,000
To Sales	2,00,000	By Balance c/d	30,000
	2,40,000		2,40,000

Problem 4.25. A and B are equal partners since 1990. Their books and records showed the following balances as on 1st January 1995:–

	Rs.
Factory Sheed Account	60,000
Due from customers	1,35,000
Advance for Machinery (Machinery installed in July 1995)	20,000

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Due to suppliers (including Rs. 5,000 for purchase of furniture in December, 1994)	93,000
Bank Overdraft	15,000
Stock at Cost	1,20,000
Bills Payable	16,000
Machinery Account	90,000
Furniture Account	25,000

A fire occurred towards end of December, 1995 and a portion of factory Shed (book value Rs. 20,000) was destroyed.

The following further information is furnished :–

1. Cost of machinery delivered and installed in July, 1995 is Rs. 60,000. The balance amount due was paid in October 1995.
2. Sales for the year 1995 were Rs. 1,00,000 per month and of which 15% was cash sales. The firm maintains a steady gross profit rate of 25% on turnover. Cash purchases amounted to Rs. 25,000

	Rs.
3. Collection from debtors	11,00,000
Payment to the creditors (including liability for furniture)	7,70,000
Discount allowed to Debtors	5,000
Discount received from creditors	6,000
4. Bills payable Accepted	50,000
Bills Payable Discharged	45,000
Partner's Drawings:	
A	25,000
B	25,000
5. Stock as on 31st December 1995	1,00,000

6. Cash and Bank Balance as on 31st December 1995 amounted to Rs. 2,10,000 and there was no Bank Overdraft on that date. The figures of Cash and Bank on 1st January 1995 is not readily available.
7. Net profit for the year may be assumed at Rs. 90,000 after providing for depreciation on machinery Rs. 15,000 and on furniture Rs. 25,000

Prepare :

1. The statement showing sources and application of funds, for 1995, showing separately statement of changes in working capital.
2. Cash Flow statement for the year ending 31st December 1995. Show your workings. *(C.A. Final)*

Solution :

Working Notes :

(1) TRADING AND PROFIT AND LOSS ACCOUNT

(for the year ending 31-12-1995)

	Rs.		*Rs.*
To Opening Stock	1,20,000	By Sales (1,00,000×12)	12,00,000
To Purchases (balancing figure)	8,80,000	By Closing stock	1,00,000
To Gross Profit (25% on Sales)	3,00,000		
	13,00,000		13,00,000

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To Discount allowed	5,000	By Gross Profit	3,00,000
To Loss of factory shed by fire	20,000	By Discount Received	6,000
To Depreciation on Machinery	15,000		
To Depreciation on Furniture	25,000		
To Sundry Expenses (balancing figure)	1,51,000		
To Net Profit (as given)	90,000		
	3,06,000		3,06,000

(2) DEBTORS A/C

	Rs.		*Rs.*
To Balance b/d (1-1-95)	1,35,000	By Cash and Bank	11,00,000
To Sales (credit)		By Discount Allowed	5,000
(85,000×12)	10,20,000	By Balance c/d (31-12-95)	50,000
	11,55,000		11,55,000

(3) TRADE CREDITORS A/C

(for the year ending 31-12-1995)

	Rs.		*Rs.*
To Cash and Bank (7,70,000-5,000)	7,65,000	By Balance b/d (93,000-5,00)	88,000
To Discount Received	6,000		
To Bills Payable Accepted	50,000	To Purchases (8,80,000-25,000)	8,55,000
To balance c/d (31-12-95)	1,22,000		
	9,43,000		9,43,000

(4) CASH AND BANK A/C

	Rs.		*Rs.*
To Balance b/d (1-1-95) (balancing figure)	26,000	By Trade Creditors A/c	7,65,000
		By Creditors for Furniture	5,000
To Cash Sales A/c (15,000×12)	1,80,000	By Machinery A/c (60,000-20,000)	40,000
To Debtors A/c	11,00,000	By Cash Purchases	25,000
		By Sundry Expenses	1,51,000
		By Bank Overdraft (Repayment)	15,000
		By Bills Payable Discharged	45,000
		By A's Drawings	25,000
		By B's Drawings	25,000
		By balance c/d (31-12-95)	2,10,000
	13,06,000		13,06,000

(5) BILLS PAYABLE A/C

	Rs.		*Rs.*
To Cash (discharged during the year)	45,000	By Balance b/d (1-1-95)	16,000
To Balance c/d (31-12-95)	21,000	By Trade Creditors A/c	50,000
	66,000		66,000

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(6) BALANCE SHEET OF M/S A AND B

as on 1-1-1995

Liabilities	*Rs.*	*Assets*	*Rs.*
Partners (A and B) Capital (balancing figure)	3,52,000	Factory Shed	60,000
		Machinery	90,000
Trade Creditors	88,000	Frniture	25,000
Creditors for Furniture	5,000	Stock	1,20,000
Bank Overdraft	15,000	Debtors	1,35,000
Bills Payable	16,000	Advance for Machinery	20,000
		Cash and Bank	26,000
	4,76,000		4,76,000

(7) BALANCE SHEET OF M/S A AND B

as on 31-12-1995

		Rs.			*Rs.*
Partners Capital (A and B)			Factory Shed	60,000	
	3,52,000		*Less* :Loss by Fire	20,000	40,000
Add: Net Profit	90,000				
	4,42,000		Machinery	90,000	
Less : Drawings	50,000	3,92,000	*Add:*Additions	60,000	
				1,50,000	
Trade creditors		1,22,000	*Less*:Depreciation	15,000	1,35,000
Bills Payable		21,000	Furniture	25,000	
			Less : Depreciation	25,000	Nil
			Debtors		50,000
			Stock		1,00,000
			Cash and Bank Balance		2,10,000
		5,35,000			5,35,000

STATEMENT OF CHANGES IN WORKING CAPITAL

	1-1-1995	*31-12-1995*	*Increase in W.C.*	*Decrease in W.C.*
	Rs.	*Rs.*	*Rs.*	*Rs.*
Current Assets :				
Cash and Bank	26,000	2,10,000	1,84,000	
Debtors	1,35,000	50,000		85,000
Stock	1,20,000	1,00,000		20,000
Advance for Machinery	20,000	—		20,000
Total of Current Assets	3,01,000	3,60,000		
Current Liabilities :				
Trade Creditors	88,000	1,22,000		34,000
Bank Overdraft	15,000	—	15,000	
Bills Payable	16,000	21,000		5,000
Creditors for Furniture	5,000	—	5,000	
Total of Current Liabilities	1,24,000	1,43,000		
Working Capital (CA-CL)	1,77, 000	2,17,000		
Net Increase in W.C	40,000			40,000
	2,17,000	2,17,000	2,04,000	2,04,000

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STATEMENT OF SOURCES AND APPLICATIONS OF FUNDS

Sources		*Rs.*	*Applications*	*Rs.*
Funds from Operations:			Purchase of Machinery	60,000
Net Profit	90,000		Partners' Drawings	50,000
Add: Depreciation	40,000		Net Increase in W.C	40,000
Loss by Fire	20,000			
		1,50,000		
		1,50,000		1,50,000

CASH FLOW STATEMENT

	Rs.		*Rs.*
Opening Balance of Cash and Bank as on 1-1-1995	26,000	*Outflows of Cash:* Payment for Machinery (60,000-20,000)	40,000
Add : Cash Inflows		Payment of Bank Overdraft	15,000
Cash Operating Profit (90,000+40,000+20,000)	1,50,000	Payment to Creditors for Furniture	5,000
Increase in Trade Creditors	34,000	Drawings of Partners	50,000
Increase in Bills Payable	5,000	Closing Balance of Cash	1,10,000
Decrease in Debtors	85,000		
Decrease in Stock	20,000		
	3,20,000		3,20,000

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5

Working Capital Management

Problem 5.1. Traders Ltd. are engaged in large-scale retail business. From the following information, you are reqiuired to forecast their working capital requirement :

Projected annual sales	Rs. 130 lakh
Percentage of Net Profit on Cost of sales	25%
Average credit period allowed to debtors	8 weeks
Average credit period allowed by creditors	4 weeks
Average stock carrying (in terms of sales requirements)	8 weeks
Add 10% to computed figures to allow for contingencies	

Solution :

Projected Annual Sales	= Rs. 130 lakhs
Net Profit (25% on cost of sales or 20% on sales)	= Rs. $130 \times \frac{25}{125}$
Cost of sales	= 130 lakh – 26 lakhs
	= Rs. 104 lakhs
Cost of sales per week	= Rs. 104 ÷ 52 lakhs
	= Rs. 2 lakhs.

FORECAST OF WORKING CAPITAL REQUIREMENTS

			Rs. (in lakhs)
Current Assets :			
	Stock (at cost – 8 weeks)	= Rs. 2 × 8 lakhs	16.00
	Debtors (8 weeks at cost)	= Rs. 2 × 8 lakhs	16.00
			32.00
Less :	*Current Liabilities*		
	Creditors (4 weeks).	= Rs. 2 × 4 lakhs	8.00
	Working Capital		24.00
Add :	10% for contingencies		2.40
	Net Working Capital Required		26.40

Note : Profits have been ignored while calculating working capital requirements as funds provided by profit may or may not be used as working capital.

Problem 5.2. The following information has been submitted by a borrower :

(i)	Expected level of production	1,20,000 units
(ii)	Raw materials to remain in stock on an average	2 months
(iii)	Processing period for each unit of product	1 month
(iv)	Finished goods remain in stock on an average	3 months
(v)	Credit allowed to the customers from the date of despatch	3 months

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(vi) Expected ratios of cost to selling price :
  (a) Raw matrerials– 60%
  (b) Direct wages– 10%
  (c) Overheads – 20%

(vi) Selling price per units Rs. 10

(viii) Expected margin on sale 10%

You are required to estimate the working capital requirements of the borrower.

Solution :

STATEMENT OF WORKING CAPITAL REQUIREMENTS

		Rs.
Current Assets :		
Stock of Raw Material (2 months) $1,20,000 \times 10 \times \frac{60}{100} \times \frac{2}{12}$		1,20,000
Work-in-process (1 months) :	*Rs.*	
Material $1,20,000 \times 10 \times \frac{60}{100} \times \frac{1}{12}$	60,000	
Direct Wages $1,20,000 \times 10 \times 10/100 \times 1/12$	10,000	
Overheads $1,20,000 \times 10 \times 20/100 \times 12$	20,000	
		90,000
Stock of Finished Goods (3 months) ;		
Material $1,20,000 \times 10 \times \frac{60}{100} \times \frac{3}{12}$	1,80,000	
Direct Wages $1,20,000 \times 10 \times \frac{10}{100} \times \frac{3}{12}$	30,000	
Overheads $1,20,000 \times 10 \times \frac{20}{100} \times \frac{3}{12}$	60,000	
		2,70,000
Sundry Debtors (3 months) at cost :		
$1,20,000 \times 10 \times \frac{90}{100} \times \frac{3}{12}$		2,70,000
		7,50,000
Less ; Current Liabilities		Nil
Working Capital Required		7,50,000

Problem 5.3. M/s. Sanjiv Bros., who are willing to purchase a business, have consulted you and on one point, on which you are asked to advise them, is the average amount of working capital which could need to be employed in the first year's trading.

You are given following estimates and are requested to add 15% to your computed figures to allow for contigencies :

		Per annum
1.	Average Amount of Stocks :	
	Finished goods	30,000
	Raw Materials	60,000
2.	Average Credit given :	
	Inland sales 4 weeks	2,60,000
	Export sales 2 weeks	6,50,000
3.	Lag in payment of expenses :	
	Wages $1^1/_2$ weeks	2,60,000
	Material and overheads 4 weeks	3,90,000

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Solution :

ESTIMATE OF WORKING CAPITAL RQUIREMENTS

		Rs.
Current Assets :		
Stock of raw materials		60,000
Stock of finished goods		30,000
Debtors (taken to be 100% of sales *i.e.* all sales assumed to be on credit) :	*Rs.*	
Inland sales : $\frac{2,60,000 \times 4}{52}$	20,000	
Export sales : $\frac{6,50,000 \times 2}{52}$	25,000	45,000
		1,35,000
Less : Current Liabilities :		
Lag in payment of wages $\frac{2,60,000 \times 3}{2 \times 52}$	7,500	
Lag in payment of materials and overheads $\frac{3,90,000 \times 4}{52}$	30,000	
		37,500
		97,500
Add : 15% Margin for Contigencies		14,625
		1,12,125

Problem 5.4. Shri Harish Gupta wishes to start a trading business and furnishes the following particulars :

(i) Estimated Annual Sales – Rs. 10,80,000

(ii) Estimated Fixed Expenses – Rs. 2,100 p.m., of which depreciation amounted to Rs. 500 and estimated variable expenses chargeable to P and L Account equal 5% of sales.

(iii) Expected Profit on purchases – 20%

(iv) Expected Stock turnover – 5 times

(v) The sales and purchases will occur evently throughout the year.

(vi) All purchases will be made on one month's credit.

(vii) Customers will be allowed two month's credit.

(viii) 25% of sales will be made against cash.

You are required to calculate :

(a) His estimated prorit for the year.

(b) His average working capital requirements.

Solution :

ESTIMATED ANNUAL PROFIT OF SHRI HARISH

	Rs.
Sales	10,80,000
Less : Cost of Goods Sold or Purchases $\left(10,80,000 \times \frac{100}{120}\right)$	9,00,000
Gross Profit	1,80,000

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Less : Fixed Expenses (1600 × 12)		19,200	
Depreciation (500 × 12)		6,000	
Variable Expenses $\left(10,80,000 \times \frac{5}{100}\right)$		5,4,000	
			79,200
Estimated Net Profit			1,00,800

STATEMENT OF AVERAGE WORKING CAPITAL REQUIREMENTS

			Rs.
Current Assets :			
Stock $\left(\frac{\text{Cost of Goods Sold}}{\text{Stock Turnover}} = \frac{9,00,000}{5}\right)$			1,80,000
Debtors $\left(10,80,000 \times \frac{75}{100} \times \frac{2}{12}\right)$			1,35,000
Cash (assumed for one month's expenses)			
Fixed Expenses (other than depreciation)		1,600	
Variable Expenses $54,000 \times \frac{1}{12}$		4,500	6,100
			3,21,100
Less : Current Liabilities			
Creditors (1 month) $9,00,000 \times \frac{1}{12}$			75,000
Working Capital Required			2,46,100

Note : If total purchases are taken to be cost of goods sold + closing stock, then creditors for 1 month shall be $(9,00,000 + 1,80,000) \times \frac{1}{12}$ = Rs. 90,000. In that case the amount of Working Capital will be Rs. 3,21,100 – 90,000 = Rs. 2,31,100

Problem 5.5. Calculate working capital from the following particulars :

		Rs.
1.	Annual Expenses :	
	Wages	52,000
	Stores and Material	9,600
	Office Salaries	12,480
	Rent	2,000
	Other Expenses	9,600
2.	Average amount of stock to be maintained :	
	Stock of finished goods	1,000
	Stock of materials and stores	1,600
	Expenses paid in advance :	
	Quarterly advance	1,600 p.a.
3.	Annual Sales	
	Home Market	62,400
	Foreign Market	15,600
4.	Lag in payment of expenses :	
	Wages	$1\frac{1}{2}$ weeks

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	Stores and Material	$1\frac{1}{2}$ months
	Office Salaries	1/2 months
	Rent	6 months
	Other Expenses	$1\frac{1}{2}$ months
5.	Credit allowed to customers :	
	Home Market	6 weeks
	Foreign Market	$1\frac{1}{2}$ weeks.

(Rajasthan M. Com.)

Solution :

CALCULATION OF WORKING CAPITAL

		Rs.
Current Assets :		
Stock of finished goods		1,000
Stock of materials and stores		1,600
Expenses paid in advance (Quarterly) $1,600 \times \frac{1}{4}$		400
Sundry Debtors : (1)	*Rs.*	
Home Market $62,400 \times \frac{6}{52}$	7,200	
Foreign Market $15,600 \times \frac{3}{2} \times \frac{1}{52}$	450	
		7,650
		10,650
Less : Current Liabilities :		
Outstanding Expenses :		
Wages $52,000 \times \frac{3}{2} \times \frac{1}{52}$	1,500	
Office Salaries $12,480 \times \frac{1}{2} \times \frac{1}{52}$	520	
Rent $2,000 \times \frac{6}{12}$	1,000	
Other Expenses $9,600 \times \frac{3}{2} \times \frac{1}{52}$	1,200	
Creditors for store and material $9,600 \times \frac{3}{2} \times \frac{1}{52}$	1,200	
		5,420
Working Capital Required		5,230

Note : (1) As cost of sales is not been given in the question, sundry debtors have been taken at selling price.

Problem 5.6. From the following information prepare a statement showing the working capital requirements :

(1) in total and (2) as regards each constituent part of working capital.

Budgeted Sales Rs. 2,60,000 per annum.

Analysis of one rupee of sales :	*Rs.*
Raw Material	0.30
Direct Labour	0.40

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Overheads	0.20
Total cost	0.90
Profit	0.10
Sales	1.00

It is estimated that :

1. Raw materials are carried in stock for 3 weeks and finished goods for 2 weeks.
2. Factory processing will take 3 weeks.
3. Suppliers will give 5 weeks' credit
4. Customers will rquire 8 weeks' credit. *(M. Com., Madras)*

Solution :

STATEMENT SHOWING THE WORKING CAPITAL

		Rs.
Current Assets :		
	Stock of raw material (3 weeks) $2,60,000 \times 0.30 \times 3/52$	4,500
	Stock of finished goods (2 weeks at cost) $2,60,000 \times 0.90 \times \frac{2}{52}$	9,000
	Work-in-process (3 weeks) $2,60,000 \times 0.90 \times 3/52$	13,500
	Sundry Debtors at Cost (8 weeks) $2,60,000 \times 0.90 \times 8/52$	36,000
		63,000
Less :	Current Liabilities :	
	Sundry Creditors (5 weeks) $2,60,000 \times 0.30 \times 5/52$	7,500
	Working Capital Required	55,500

Problem 5.7. The management of Vishal Ltd., has called for a statement showing the working capital needed to finance a level of activity of 3,00,000 units of output for the year. The cost structure for the company's product, for the above-mentioned activity level, is detailed below :

	Cost per units Rs.
Raw materials	20
Direct labour	5
Overheads	15
Total	40
Profit	10
Selling Price	50

(a) Past experience indicates that raw materials are held in stock, on an average for two months.

(b) Work-in-process (100% complete in regard to materials and 50% for labour and overheads) will approximately be to half a month's production.

(c) Finished goods remain in warehouse, on an average for a month.

(d) Suppliers of material extend a month's credit.

(e) Two months credit is allowd to debtors, calculation of debtors may be made at selling price.

(f) A minimum cash balance of Rs. 25,000 is expected to be maintained.

(g) The production pattern is assumed to be even during the year. Prepare the statement of working capital requirements.

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STATEMENT SHOWING WORKING CAPITAL REQUIREMENTS

		Rs.
Current Assets :		
Stock of Raw Materials (2 months)		
$3,00,000 \times 20 \times \frac{2}{12}$		10,00,000
Stock of work-in-process (1/2 month) ;		
Raw Materials $3,00,000 \times 20 \times \frac{1}{2} \times \frac{1}{12}$	= 2,50,000	
Direct Labour (50%)		
$3,00,000 \times 5 \times \frac{1}{2} \times \frac{1}{12} \times \frac{50}{100}$	= 31,250	
Overheads (50%) $3,00,000 \times 15 \times \frac{1}{2} \times \frac{1}{12} \times \frac{50}{100}$	= 93,750	3,75,000
Stock of Finished Goods (1 month at cost) :		
Raw Materials $3,00,000 \times 20 \times \frac{1}{12}$	= 5,00,000	
Direct Labour $3,00,000 \times 5 \times \frac{1}{12}$	= 1,25,000	
Overheads $3,00,000 \times 15 \times \frac{1}{12}$	= 3,75,000	
		10,00,000
Debtors (2 months, at Selling Price as given) :		
$3,00,000 \times 50 \times \frac{2}{12}$		25,00,000
Cash Balance required		25,000
Total		49,00,000
Less : Current Liabilities :		
Creditors for raw materials (1 month) :		
$3,00,000 \times 20 \times \frac{1}{12}$		5,00,000
Working Capital required		44,00,000

Problem 5.8. The Board of Directors of Nanak Engineering Company Private Ltd. request you to prepare a statement showing the working Capital Requirements for a level of activity of 1,56,000 units of production.

The following information is available for your calculations :

	Per unit Rs.
(A)	
Raw Materials	90
Direct Labour	40
Overheads	75
	205
Profit	60
Selling price per unit	265

(B) *(i)* Raw materials are in stock, on average one month.
(ii) Materials are in process, on average 2 weeks.
(iii) Finished goods are in stock, on average one month.
(iv) Credit allowed by suppliers, one month.
(v) Time lag in payment from debtors, 2 months.
(vi) Lag in payment of wages, $1\frac{1}{2}$ weeks.
(vii) Lag in payment of overheads is one month.

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20% the output is sold against cash. Cash in hand and at bank is expected to be Rs. 60,000. It is to be assumed that production is carried on evenly throughout the year, wages and overheads accrue similarly and a time period of 4 weeks is equivalent to a month. *(C.A. Final)*

Solution :

STATEMENT SHOWING THE WORKING CAPITAL REQUIREMENTS

			Rs.
Currents Assets			
	Sock of Raw		
	Material (1 month) $\frac{90 \times 1,56,000 \times 4}{52}$		10,80,000
	Work-in-Process (2 weeks) :		
	Raw Matrial : $\frac{90 \times 1,56,000 \times 2}{52}$	5,40,000	
	Labour : $\frac{40 \times 1,56,000 \times 2}{52}$	2,40,000	
	Overheads : $\frac{75 \times 1,56,000 \times 2}{52}$	4,50,000	
			12,30,000
	Stock of Finished Goods (1 month) :		
	Raw Material : $\frac{90 \times 1,56,000 \times 4}{52}$	10,80,000	
	Labour : $\frac{40 \times 1,56,000 \times 4}{52}$	4,80,000	
	Overheads : $\frac{75 \times 1,56,000 \times 4}{52}$	9,00,000	
			24,60,000
	Sundry Debtors (2 months) : (80% of sales) at cost		
	Raw Material : $\frac{90 \times 1,56,000 \times 8 \times 80}{100 \times 52}$	17,28,000	
	Labour : $\frac{40 \times 1,56,000 \times 8 \times 80}{100 \times 52}$	7,68,000	
	Overheads : $\frac{75 \times 1,56,000 \times 8 \times 80}{100 \times 52}$	14,40,000	
			39,36,000
	Cash in hand and at bank		60,000
			87,66,000
Less :	Current Liabilities		
	Sundry Creditors for materials (1 month) $\frac{90 \times 1,56,000 \times 4}{52}$	*Rs.* 10,80,000	
	Lag in payment of wages ($1\frac{1}{2}$ weeks) $\frac{40 \times 1,56,000 \times 3}{2 \times 52}$	1,80,000	
	Lag in payment of overheads (1 months) $\frac{75 \times 1,56,000 \times 4}{52}$	9,00,000	
			21,60,000
	Working Capital Required		66,06,000

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Note : 1. Usually, wages and overheads accrue evently. On average, half the wages and overheads may be taken while calculating the amount blocked in work-in-process. In that case the value of work-in-process shall be Rs. 8,85,000 and the amount of working capital required will be Rs. 62,61,000.

2. Profits have been ignored as funds provided by profits may or may not be used as working capital.

Problem 5.9. A proforma cost sheet of a company provides the following particulars :

Element of Cost	
Raw Materials	40%
Labour	10%
Overheads	30%

The following further particulars are available.

(a) Raw materials are to remain in stores on an average – 6 weeks.
(b) Processing time is – 4 weeks.
(c) Finished goods are required to be in stock on an average period of –8 weeks.
(d) Credit period allowed to debtors, on average – 10 weeks.
(e) Lag in payment of wages – 2 weeks.
(f) Credit period allowed by creditors – 4 weeks
(g) Selling price is Rs. 50 per unit.

You are required to prepare an estimate of working capital requirements adding 10% margin for contigencies for a level of activity of 1,30,000 units of production.

Solution :

STATEMENT OF WORKING CAPITAL REQUIREMENTS

Current Assets			*Rs.*
Stock of Raw Material (6 weeks)	$\frac{1,30,000 \times 50 \times 40 \times 6}{100 \times 52}$		3,00,000
Work-in-process (4 weeks) :		*Rs.*	
Material	$\frac{1,30,000 \times 50 \times 40 \times 4}{100 \times 52}$	2,00,000	
Labour	$\frac{1,30,000 \times 50 \times 10 \times 4}{100 \times 52}$	50,000	
Overheads	$\frac{1,30,000 \times 50 \times 30 \times 4}{100 \times 52}$	1,50,000	
Stock of Finished Goods (8 weeks) :			4,00,000
Material	$\frac{1,30,000 \times 50 \times 40 \times 8}{100 \times 52}$	4,00,000	
Labour	$\frac{1,30,000 \times 50 \times 10 \times 8}{100 \times 52}$	1,00,000	
Overheads	$\frac{1,30,000 \times 50 \times 30 \times 8}{100 \times 52}$	3,00,000	
Sundry Debtors (10 weeks)			8,00,000
Material	$\frac{1,30,000 \times 50 \times 40 \times 10}{100 \times 52}$	5,00,000	
Labour	$\frac{1,30,000 \times 50 \times 10 \times 10}{100 \times 52}$	1,25,000	

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Overheads	$\frac{1,30,000 \times 50 \times 30 \times 10}{100 \times 52}$	3,75,000	10,00,000
			25,00,000
Less Current Liabilities :			
Lag in payment of wages (2 weeks)	$\frac{1,30,000 \times 50 \times 30 \times 10}{100 \times 52}$	25,000	
Sundry Creditors (4 weeks) for raw material	$\frac{1,30,000 \times 50 \times 40 \times 4}{100 \times 52}$	2,00,000	
			2,25,000
			22,75,000
Add : 10% margin for Contigencies			2,27,500
Working Capital Required			25,02,500

Note : (1) Profits have been ignored as funds provided by profits may or may not be used as working capital.

(2) For calculation of amount blocked in work-in-process, wages and overheads may be taken as half on an average assuming that wages and overheads accrue evently during the time production is in progress.

Problem 5.10. Prepare a working capital forecast from the following information :

	Rs.
Issued Share Capital	4,00,000
6% Debenturs	1,50,000

The fixed assets are valued at 3 lakhs. Production during the previous year is 1 lakh units. The same level of activity is intended during the current year.

The expected ratios of cost to selling price are :

Raw Materials	50%
Direct Wages	10%
Overheads	25%

The raw materials ordinarily remain in stores for 2 months before production. Every unit of production remains in process for 2 months. Finished goods remain in the warehouse for 4 months. Credit allowed by creditors is 3 months from the date of delivery of raw materials and credit given to debtors is 3 months from the date of despatch.

Selling price is Rs. 6 per unit. Both production and sales are in regular cycle.

Solution :

STATEMENT OF WORKING CAPITAL

			Rs.
Current Assets			
Stock of Raw Materials (2 months)	$1,00,000 \times 6 \times \frac{50}{100} \times \frac{2}{12}$		50,000
Work-in-process (2 months) :			
Raw Material	$1,00,000 \times 6 \times \frac{50}{100} \times \frac{2}{12}$	50,000	
Wages	$1,00,000 \times 6 \times \frac{10}{100} \times \frac{2}{12}$	10,000	

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Overheads $1,00,000 \times 6 \times \frac{25}{100} \times \frac{2}{12}$	25,000	85,000
Stocks of Fiinished Goods (4 months) at Cost		
$1,00,000 \times \frac{85}{100} \times \frac{4}{12} \times 6$		1,70,000
Debtors (3 months) at Cost :		
$1,00,000 \times 6 \times \frac{85}{100} \times \frac{3}{12}$		1,27,500
		4,32,500
Less : Current Liabilities :		
Creditors (3 months) for raw materials :		
$1,00,000 \times 6 \times \frac{50}{100} \times \frac{3}{12}$		75,000
Net Working Capital Required		3,57,500

Problem 5.11. From the information given below, you are required to prepare a projected Balance Sheet, Profit and Loss Account and then an estimate of working capital requirements :

		Rs.
(a)	Issued Share Capital	2,00,00
	8% Bonds	75,000
	Fixed Assets at cost	2,00,000
(b)	The expected ratios of cost to selling price are :	
	Raw materials	40%
	Labour	30%
	Overheads	20%
	Profit	10%

(c) Raw material are kept in store for an average of two months.

(d) Finished goods remain in stock for an average period of one months.

(e) Work-in-process (100% complete in regard to materials and 50% for Labour and overheads) will approximately be to half a month's production.

(f) Credit allowed to customers is two months and given by suppliers is one month.

(g) Production during the previous year was 40,000 units and it is planned to maintain the same in the current year also.

(h) Selling price is Rs. 9 per unit.

(i) Calculation of debtors may be at selling price.

Solution :

	Rs.
1. *Calculation of Sales :*	
Total Sales = $40,000 \times 9 = 3,60,000$	
2. Calculation of amount blocked in Inventories :	
(a) Stock of raw materials, $3,60,000 \times \frac{40}{100} \times \frac{2}{12}$	24,000
(b) Stock of finished goods at cost	
i.e. Material + Labour + Overhead	
$= 3,60,000 \times \frac{90}{100} \times \frac{1}{12}$	27,000

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(c) Work-in-process :

Raw material = $3,60,000 \times \frac{40}{100} \times \frac{1}{2} \times \frac{1}{12}$	6,000	
Labour = $3,60,000 \times \frac{30}{100} \times \frac{1}{2} \times \frac{1}{12} \times \frac{50}{100}$	2,250	
Overheads = $3,60,000 \times \frac{20}{100} \times \frac{1}{2} \times \frac{1}{12} \times \frac{50}{100}$	1,500	9,750

3. *Calculation of amount blocked in Debtors :*

(at selling prices given) = $3,60,000 \times \frac{2}{12}$ — 60,000

4. *Calculation of Creditors :*

Total purchases = $3,60,000 \times \frac{40}{100}$	1,44,000	
Creditors = $1,44,000 \times \frac{1}{12}$		12,000

PROJECTED PROFIT AND LOSS ACCOUNT

	Rs.		Rs.
To Cost goods sold :		By Sales	3,60,000
Raw Materials 40%)	1,44,000		
Labour (30% of 3,60,000)	1,08,000		
Overheads (20% of 3,60,000)	72,000		
To Gross Profit	36,000		
	3,60,000		3,60,000
To Interest on Bonds	6,000	By Gross Profit	36,000
To Net Profit	30,000		
	36,000		36,000

PROJECTED BALANCE SHEET

Liabilities	Rs.	*Assets*		Rs.
Share Capital	2,00,000	Fixed Assets (at cost)		2,00,000
8% Bonds	75,000	Current Assets :		
Profit and Loss A/c.	30,000	Inventories	Rs.	
Creditors	12,000	Raw Materials	24,000	
Bank Overdraft		Finished goods	27,000	
(Balancing figure)	3,750	Work-in-process	9,750	
			60,750	
		Debtors	60,000	
				1,20,750
	3,20,750			3,20,750

Working Capital = Current Assets – Current Liabilities

Current Assets = 1,20,750

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Current Liabilities *i.e.*
Sundry creditors + Bank Overdraft
= Rs. 12,000 + 3,750 = Rs. 15,750
So Working Capital = Rs. 1,20,750 – 15,750
= Rs. = 1,05,000

Problem 5.12. On 1st January the Board of Directors of ABC Ltd. wish to know the amount of Working Capital that will be required to meet the programme they have planned for the year. From the following information prepare a Working Capital forecast and a forecast Profit and Loss A/c. and Balance Sheet :

Issued Share Capital	Rs. 2,00,000
5% Debentures (Secured on assets)	Rs. 50,000
Fixed Assets on 1st January	Rs. 1,25,000
Production during the previous year	Unit 60,000

Same level of activity is expected to be maintained during the present year. The expected ratios of cost to selling price –

Raw Materials	60%
Direct Wages	10%
Overheads (excluding interest on debentures)	20%

Raw Materials are expected to remain in stores for an average of two months before issue to production.

Each unit of production is expected to be in process for one month. Finished goods will stay in the warehouse awaiting despatch to customers approximately three months.

Credit given to debtors is three months from the date of despatch.

Selling price is Rs. 5 per unit.

There is regular production and sales cycle, work in process may be assumed to be 100% complete in regard to materials and 50% complete in wages and overheads.

Solution :

STATEMENT OF WORKING CAPITAL

Current Assets :			*Rs.*
Stock of Raw Materials (2 months)			
$60,000 \times 5 \times \frac{60}{100} \times \frac{2}{12}$			30,000
Work-in-process (1 month)		*Rs.*	
Material	$3,00,000 \times \frac{60}{100} \times \frac{1}{12}$	15,000	
Labour	$3,00,000 \times \frac{10}{100} \times \frac{1}{12} \times \frac{50}{100}$	1,250	
Overheads	$3,00,000 \times \frac{20}{100} \times \frac{1}{12} \times \frac{50}{100}$	2,500	
			18,750
Stock of Finished Goods (3 months) at cost *i.e.* 90%			
$3,00,000 \times \frac{90}{100} \times \frac{3}{12}$			67,500
Debtors (3 months) at Cost *i.e.* 90%			
$60,000 \times 5 \times \frac{90}{100} \times \frac{3}{12}$			67,500
			1,83,750

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Less : Current Liabilities :	
Creditors (2 months) for raw materials $3,00,000 \times \frac{60}{100} \times \frac{2}{12}$	30,000
Net Working Capital Required	1,53,750

FORECAST PROFIT AND LOSS ACCOUNT

To Materials	1,80,000	By Cost of goods sold	2,70,000
To Wages	30,000		
To Overheads	60,000		
	2,70,000		2,70,000
To Cost of goods sold	2,70,000	By Sales	3,00,000
To Gross Profit c/d.	30,000		
	3,00,000		3,00,000
To Interest on debentures	2,500	By Gross Profit b/d	30,000
To Net Profit	27,500		
	30,000		30,000

FORECAST BALANCE SHEET

Liabilities	*Rs.*	*Assets*	*Rs.*
Share Capital	2,00,000	Fixed Assets	1,25,000
5% Debentures	50,000		
Net Profit	27,500	Raw Materials	30,000
Creditors	30,000	Work-in-Process	18,750
Bank overdraft		Finished Good	67,500
(balancing figure)	1,250	Debetors	67,500
	3,08,750		3,08,750

Problem 5.13. Manufacturing Company sells goods in the home market and earns a gross profit of 25% on sales. Its annual figures are as follows :

	Rs.
Sales	3,00,000
Materials used	1,08,000
Wages	96,000
Manufacturing expenses	1,20,000
Administrative and other expenses	30,000
Selling & Distribution expenses	18,000
Depreciation	12,000
Income tax payable in four instalments of which one falls in the next financial year	60,000

Additional information is as follows :

(i) Credit given by suppliers of materials is 2 months.

(ii) Credit allowed to customers is 1 month.

(iii) Wages are paid half month in arrear.

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(iv) Manufacturing and administrative expenses are paid one month in arrear.

(v) Selling and distribution expenses are paid quarterly in advance.

(vi) The company wishes to keep one month stock of raw material and also of finished goods.

(vii) The company believes in keeping cash of Rs. 50,000 including the overdraft limit of Rs. 20,000 not yet utilised by the company.

You are required to prepare a statement showing the working capital requiremnt of the company adding 10% margin for contingencies.

Solution :

STATEMENT SHOWING THE WORKING CAPITAL REQUIREMENTS

		Rs.
Current Assets :		
Stock of Raw Material (1 month) = 1,08,000 × $\frac{1}{12}$		9,000
Stock of Finished Goods at cost (1 month)		
= 2,40,000 × $\frac{1}{12}$		20,000
[Sales = Rs. 3,00,000		
Profit = 20% (given) *i.e.*		
$\frac{3,00,000 \times 20}{100}$ = Rs. 60,000		
Cost of Sales = Rs. 3,00,000 – 60,000 = Rs. 2,40,000]		
Amount locked up in Debtors (1 month)		
at cost, as calculated above = $\frac{2,40,000 \times 1}{12}$		20,000
Prepaid selling and distribution expeneses (Quarterly)		
= $\frac{18,000 \times 3}{12}$		4,500
Cash balance (minimum required, as given)		50,000
		1,03,500
Less : Current Liabilities		
Sundry cretditors for materials (2 months)		
$\frac{1,08,000 \times 2}{12}$	= 18,000	
Lag in payment of wages (1/2 month)		
$\frac{96,000 \times 1}{2 \times 12}$	= 4,000	
Lag in payment of manufacturing expenses (1 month)		
$\frac{1,20,000 \times 1}{12}$	= 10,000	
Lag in payment of Administrative expenses (1 month)		
$\frac{30,000 \times 1}{12}$	= 2,500	
Bank overdraft (given)	= 20,000	
		54,500
		49,000
Add : 10% Margin for Contigencies		4,900
Working Capital Required		53,900

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Problem 5.14. Exe Ltd. gives the following abridged Profit and Loss Account :

	Rs.		*Rs.*
To Material consumed	12,00,000	By Sales	25,00,000
To Wages	2,00,000		
To Manufacturing expenses (including depreciation)	3,00,000		
To Office and administrative expenses	1,50,000		
To Selling and Distribution expenses	2,40,000		
To Net Profit	4,10,000		
	25,00,000		25,00,000

It is company's policy to maintain the following stocks :

(a) Finished Goods $1\frac{1}{2}$ month's sale

(b) Materials 1 month's consumption

Work-in-process is equal to 1 month's production in terms of materials and $\frac{1}{2}$ month's wages and manufacturing expenses.

The company extends 3 months credit to its customers and receives 2 months credit from suppliers and pays all expenses and wages one month in arrear but selling and distribution expenses are paid two months in advance.

The company would like to keep Rs. 50,000 in cash at all times. A safety margin of 10% on total current assets is desirable.

Estimate the working capital requirements for the company.

Solution :

		Rs.
1.	Cash cost of goods produced/sold :	
	Material used	12,00,000
	Wages	2,00,000
	Manufacturing expenses *less* depreciation (3,00,000 – 1,00,000) being non-cash	2,00,000
		16,00,000
2.	Cost of Finished goods for $1\frac{1}{2}$ month's production $16,00,000 \times \frac{3}{2} \times \frac{1}{12}$	= Rs. 2,00,000
3.	Cost of Materials for 1 month : $12,00,000 \times \frac{1}{12}$	= Rs. 1,00,000
4.	Work-in-process :	
	Material (1 month) $12,00,000 \times \frac{1}{12}$ =	Rs. 1,00,000
	Wages + Manufacturing expenses $\left(\frac{1}{2}\right.$ month $\left.\right)$ (*Less* depreciation)	

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$\frac{2,00,000 + 2,00,000}{2 \times 12}$	16,667
	1,16,667

5. Debtors (3 months) shall be $25,00,000 \times \frac{3}{12}$
= Rs. 6,25,000 at selling price but the cash cost of producing these goods will be
$16,00,000 \times \frac{3}{12}$ = Rs. 4,00,000

6. Total cash expenses other than selling and distribution expenses :

	Rs.
Wages	2,00,000
Manufacturing expenses	2,00,000
Office and Administrative expenses	1,50,000
	5,50,000

One month's expenses are $\frac{5,50,000}{12}$, *i.e.* Rs. 45,833

7. Selling and Distribution Expenses = 2,40,000
2 months' selling and distribution expenses = $2,40,000 \times \frac{2}{12}$ = Rs. 40,000

ESTIMATES OF WORKING CAPITAL REQUIREMENTS

Current Assets			*Rs.*
	Stock of Finished Goods		2,00,000
	Stock of Material		1,00,000
	Work-in-Process		1,16,667
	Sundry Debtors		4,00,000
	Advance payment of selling and distribution expenses		40,000
	Cash Balance		50,000
			9,06,667
Add :	10% safety margin on total current assets		90,667
			9,97,334
Less :	Current Liabilities	*Rs.*	
	Sundry Creditors = $12,00,000 \times \frac{2}{12}$	2,00,000	
	Outstanding expenses	45,833	
			2,45,833
	Working Capital Required		7,51,501

Poblem 5.15. From the following projected Profit and Loss Statement of a newly started company, you are required to prepare an estimate of the working capital requirements :

		Rs.	Rs.
	Sales		15,00,000
Less :	Cost of good sold :		
	Material used	6,00,000	
	Wages & Manufacturing expenses	3,00,000	
	Depreciation	1,00,000	
		10,00,000	

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Less : Stock of finished goods (10% of goods produced)	1,00,000	
Gross Profit		9,00,000
		6,00,000
Administrative Expenses	1,20,000	
Selling & Distribution Expenses	72,000	1,92,000
		4,08,000
Provision for tax		1,00,000
Profit after tax		3,08,000

The above given figures relate to the goods that have been finishd and not work-in-process. Goods equal to 20% of the year's production are in process on the average, requiring 100% materials but only 40% of the other expenses. The company maintains two months' consumption of materials in stock. All expenses are paid one month in arrear. Suppliers of material extend 2 months' credit. 20% of the total sales are made for cash and the rest at two months' credit. 70% of the Income-tax has to be paid in advance in quarterly instalments.

Solution :

ESTIMATE OF WORKING CAPITAL REQUIREMENTS

Current Assets :		*Rs.*
Stock of Raw material 6,00,000 × $\frac{2}{12}$		1,00,000
Work-in-process : Raw Material 20% of 6,00,000		
i.e. 6,00,000 × $\frac{20}{100}$	1,20,000	
Wages and Manufacturing expenses : 40% of 20% of 3,00,000		
i.e. $\frac{40}{100} \times \frac{20}{100} \times$ 3,00,000	24,000	
		1,44,000
Stock of Finished Goods 10% of the Cash Cost of goods produced *i.e.* (Material 6,00,000 + Wages and Expenses Rs. 3,00,000)		90,000
Debtors at Cost :		
Cash Cost of goods produced	9,00,000	
Less : 10% for stock	90,000	
	8,10,000	
Less : 20% sold for cash	1,62,000	
Cost of Crdit Sales	6,48,000	
Debtors for two months, 6,48,000 × $\frac{2}{12}$		1,08,000
		4,42,000
Less : Current Liabilities		
Sundry Creditors (for goods) 6,00,000 × $\frac{1}{12}$	1,00,000	

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Wages and Manufacturing Expenses Outstanding (1 month) $3,00,000 \times \frac{1}{12}$	25,000	
Administrative expenses outstanding $1,20,000 \times \frac{1}{12}$	10,000	
Selling and Distribution Expenses Outstanding $72,000 \times \frac{1}{12}$	6,000	1,41,000
Working Capital Required		3,01,000

Note : (1) Income-tax and depreciation have been ignored while calculating working capital requirements.

(2) Administrative expenses and selling and distribution expenses have been ignored while calculating the amount blocked in sundry debtors.

Problem 5.16. The R. G. Company Ltd. has been having a fast rate of growth of its sales in recent years. Control, however, has been poor resulting in a financial strain. The financial position of the company of is as shown below :

Liabilities	*31st Dec. 1994 Rs.*	*31st Dc 1995 Rs.*	*Assets*	*31st Dec 1994 Rs.*	*31st Dec. 1995 Rs.*
Equity capital	2,00,000	2,00,000	Plant and Machinry	3,00,000	2,70,000
Reserves	1,00,000	1,10,000	Inventory	2,40,000	2,90,000
Bank Loan	3,50,000	4,00,000	Debtors	2,00,000	3,00,000
Creditors	1,50,000	1,90,000	Cash	60,000	40,000
	8,00,000	9,00,000		8,00,000	9,00,000

The following additional data are available :

Sales during the 2 years are : 1994 – Rs. 12,00,000 ; and 1995 – Rs. 13,20,000.

Purchases are 60% of sales. Inventory 3 months requirements. Credit term : Suppliers $1^1/_2$ month purchases and customers 1 month's sales. With the above data calculate the working capital rquirements and then comment on the working capital of the two years. *(I.C.W.A. Final)*

Solution :

STATEMENT SHOWING THE WORKING CAPITAL REQUIREMENT

	Rs.
Current Assets :	
Inventory (3 months) $12,00,000 \times \frac{60}{100} \times \frac{3}{12}$	1,80,000
Debtors (1) (1 month) $12,00,000 \times \frac{1}{12}$	1,00,000
Cash (assumed)	50,000
	3,30,000

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Less : Current Liabilities	
Sundry Creditors ($1\frac{1}{2}$ months)	
$12,00,000 \times \frac{60}{100} \times \frac{3}{2} \times \frac{1}{12}$	90,000
Working Capital Required	2,40,000

Note : (1) In the absence of information regarding cost, debtors have been taken at selling price.

STATEMENT OF ACTUAL WORKING CAPITAL

	1994 Rs.	*1995* Rs.
Current Assets :		
Inventory	2,40,000	2,90,000
Debtors	2,00,000	3,00,000
Cash	60,000	40,000
	5,00,000	6,30,000
Less : Current Liabilities :		
Creditors	1,50,000	1,90,000
Working Capital	3,50,000	4,40,000

Comments : Working capital required by the company is Rs. 2,40,000. But the actual amount invested in working capital is much more in both the years. In 1994 the actual working capital is Rs. 3,50,000 which is in excess by Rs. 1,10,000 as compared to requirements. In 1995 the working capital is in excess by Rs. 2,00,000 (4,40,000 – 2,40,000). The working capital is in excess due to excessive amount invsted in inventories and debtors in both the years. If these current assets can be reduced to the estimated levels, then the excess amount of working capital can be utilised to pay off the bank Loan.

Note : Bank Loan has been taken as a long-term liability.

Problem 5.17. A newly formed company has applied for a short-term loan to a commercial bank for financing its working capital requirements. You are requested by the bank to prepare an estimate of the requirements of the working capital for that company. Add 10% to your estimated figure to cover unforeseen contingencies. The information about the projected profit and loss account of this company is as under :

		Amount (Rs.)
Sales		21,00,000
Cost of Goods Sold		15,30,000
Gross profit		5,70,000
Administrative Expenses	1,40,000	
Selling Expenses	1,30,000	
		2,70,000
Profit before tax		3,00,000

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Provision for tax	1,00,000
Cost of Goods sold has been derived as follows :	
Material used	8,40,000
Wages and manufacturing expenses	6,25,000
Depreciation	2,35,000
	17,00,000
Less : Stock of finished goods (10% produced not yet sold)	1,70,000
	15,30,000

The figures given above relate only to the goods that have been finished and not work-in-process ; goods equal to 15 percent of the year's production (in term of physical units) ar in progress on an average, requiring full materials but only 40 per cent of the other expenses. The company believes in keeping two months consumption of material in stock.

All expenses are paid one month in arrear ; suppliers of material extend $1\frac{1}{2}$ months credit ; sales are 20 per cent cash ; rest are at two months credit ; 70 percent of the income tax has to be paid in advance in quarterly instalments. You can make such other assumptions as you deem necessary for estimating working capital requirements.

Solutuion :

ESTIMATE OF WORKING CAPITAL REQUIREMENTS

		Rs.
Current Assets :		
Stock of Raw Material (2 months)		
$8,40,000 \times \frac{2}{12}$		1,40,000
Work-in-process :		
Raw material 15% of Rs. 8,40,000		
$8,40,000 \times \frac{15}{100}$	1,26,000	
Other (wages and manufacturing) expenses		
40% of 15% of Rs. 6,25,000		
$6,25,000 \times \frac{40}{100} \times \frac{15}{100}$	37,500	
		1,63,500
Stock of Finished Goods (at cost) :		
10% of the cash cost of goods produced		
10% of (Material Rs. 8,40,000 + wages		
& expensees Rs. 6,25,000) $\frac{10}{100} \times 14,65,000$		1,46,500
Debtors at cost (2 months) :		
	Rs.	
Cash cost of goods produced	14,65,000	
Less 10% for stock	1,46,500	
	13,18,500	
Less 20% sold for cash	2,63,700	
	10,54,800	
2 months' debtors = $10,54,800 \times \frac{2}{12}$		1,75,800
		6,25,800

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Less :	(Current Liabilities) :			
	Sundry creditors ($1\frac{1}{2}$ months)		*Rs.*	
	$8,40,000 \times \frac{3}{2} \times \frac{1}{12}$		1,05,000	
	Lag in payments (1 month) :	*Rs.*		
	Wages and Manufacturing expenses	6,25,000		
	Administrative Expenses	1,40,000		
	Selling Expenss	1,30,000		
		8,95,000		
	$8,95,000 \times \frac{1}{12}$		74,583	1,79,583
	Working Capital Rquirements			4,46,217
Add :	10% for contigencies			44,622
	Total			4,90,839

Working Notes :

(i) Depreciation being a non-cash item has been ignored while calculating cost of goods sold for the purpose of determining work-in-process, stock of finished goods and sundry debtors.

(ii) Administrative expenses and selling expenses have not been considered while calculating cost of sundry debtors. In case these are included in cost, amount blocked in sundry debtors shall be Rs. 2,11,800.

(iii) Profits have been ignored as funds provided by profit may or may not be used as working capital.

(iv) As profit is not taken into consideration, income-tax has been excluded from calculations of working capital.

Problem 5.18. Your company proposes to raise its turnover from Rs. 12,00,000 this year to Rs. 16,80,000 next year and to Rs. 19,20,000 in the succeeding year. It is expectd that purchases will go up from Rs. 3,60,000 this year to Rs. 4,80,000 and then to Rs. 5,40,000 in the next two years. A steady profit of 10% on turnover is expected over the years and the material, labour and factory overheads estimated uniformly to be 30%, 20% and 30% respectively of the total cost. At the end of each year the raw material stock would amount to two months consumption, work in progress to one month's factory cost and finished goods to half a month's total cost. There is a two month's credit period allowed to customers and received from suppliers. Ignoring prepayments and accrued charges as they normally offset each other, work out an estimate of working capital requirements for this year as well as the next two years.

[Adapted I.C.W.A. Final]

Solution :

Working Notes :

		Ist Year	*2nd Year*	*3rd Year*
		Rs.	*Rs.*	*Rs.*
(a)	Estimated Sales	12,00,000	16,80,000	19,20,000
(b)	Profit (10% on Sales)	1,20,000	1,68,000	1,92,000
(c)	Total Cost of Sales	10,80,000	15,12,000	17,28,000

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(d)	Material Cost (30% of total cost)	3,24,000	4,53,000	5,18,400
(e)	Labour Cost (20% of total cost)	2,16,000	3,02,400	3,45,600
(f)	Overhead Cost (30% of total cost)	3,24,000	4,53,600	5,18,400
(g)	Factory Cost (d + e + f)	8,64,000	12,09,600	13,82,400
(h)	Selling and Other Cost (c – g)	2,16,000	3,02,400	3,45,600

ESTIMATE OF WORKING CAPITAL REQUIREMENTS

	1st Year (Rs.)	*2nd Year (Rs.)*	*3rd Year (Rs.)*
Current Assets :			
Stock of Raw Material ($\frac{2}{12}$ of d)	54,000	75,600	86,400
Work-in-Process ($\frac{1}{12}$ of g)	72,000	1,00,800	1,15,200
Stock of Finished Goods ($\frac{1}{24}$ of c)	45,000	63,000	72,000
Sundry Debtors ($\frac{2}{12}$ of a)	2,00,000	2,80,000	3,20,000
Cash-assumed 1 month ($\frac{2}{12}$ of e, f and h)	63,000	88,200	1,00,800
Total of Current Assets	4,34,000	6,07,600	6,94,400
Less : Current Liabilities :			
Sundry Creditors ($\frac{2}{12}$ of Purchases, *i.e.* 3,60,000 ; 4,80,000 ; and 5,40,000)	60,000	80,000	90,000
Estimated Working Capital	3,74,000	5,27,600	6,04,400

Problem 5.19. Compute maximum bank borrowings' permissible under method I, II and III of Tandon Committee norms from the following figures and comment on each method :

Current Liabilities	*(Rs. in lakhs)*	*Currents Assets :*	*(Rs. in lakhs)*
Creditors for purchases	200	Raw Material	400
Other Current Liabilities	100	Work-in-process	40
	300	Finished Goods	180
Bank borrowings	400	Receivables	100
	700	Other Current Assets	20
			740

Assume Core Current Assets are Rs. 190 lakhs.

Solution :

Method I

		(Rs. in lakhs)
	Total Current assets	740
Less :	Current Liabilities	300
	Working Capital	440
	25% from Long-term sources	110
	Maximum bank borrowings permissible	330
	Actual bank borrwings	400
	Excess bank borrowings	70

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Comments : The excess bank borrowing of Rs. 70 lakhs may be converted into long-term, loans.

Method II

Total current assets	740
25% from Long-term sources	185
	555
Less : Current Liabilities	300
Maximum bank borrowings permissible	255
Actual bank borrowings	400
Excess bank borrowings	145

Comments : The excess bank borrowing of Rs. 145 Lakhs may be converted into long-term loans :

Method III

Total Current assets	740
Less : Core Current assets	190
	550
25% from Long term sources	137
	413
Less : Current – Liabilities	300
Maximum bank borrowings permissibile	113
Actual bank borrowings	400
Excess bank borrowings	287

Comments : The excess bank borrowings of Rs. 287 lakhs may be converted into long-term loans.

Problem 5.20. X Ltd. sells goods at a gross profit of 20%. It includes depreciation as part of cost of production. The following figures for the 18 months period ending 31st December, 1993 are given to enable you to ascertain the requirements of Working Capital of the Company on a cash cost basis.

In your working, you are required to assume that :

(i) a sefety margin of 15% will be maintained ;
(ii) cash is to be held to the extent of 50% of current liabilities :
(iii) there will be no work -in-process ;
(iv) tax is to be ignored.

Stock of raw materials and finished goods are kept at one month's requirements.

All working notes are to form part of your answer.

	Rs.
Sales – at 2 months' credit	27,00,000
Materials consumed (supplier's credit is for 2 months)	6,75,000
Wages (paid at the beginning of next month)	5,40,000
Manufacturing expenses outstanding at the end of the year (Cash expenses are paid one month in arrear)	60,000
Total Administrative expenses paid as above	1,80,000
Sales promotion expenses – paid quarterly and in advance	90,000

Solution :

WORKING NOTES

1. Calculation of Total Manufacturing Expenses

	Rs.
Sales	27,00,000
Less : Gross Profit (20%)	5,40,000

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Manufacturing Cost		21,60,000
Less : Materials	6,75,000	
Wages	5,40,000	12,15,000
Total Manufacturing Expenses		9,45,000

2. Calculation of Depreciation :

Total Manufacturing Expenses	9,45,000
Less : Cash Manufacturing Expenses (60,000 × 12)	7,20,000
Depreciation	2,25,000

3. Calculation of Total Cost of Sales :

Total Manufacturing Cost		21,60,000
Less : Depreciation (non-cash)		2,25,000
Cash Cost of Manufacturing		19,35,000
Add : Administrative Expenses	1,80,000	
Sales Promotion Expenses	90,000	2,70,000
		22,05,000

4. Calculation of Cash in Hand :

50% of Current Liabilities ($\frac{50}{100}$ × 2,32,500) 1,16,250

[Current Liabilities are calculated in Statement of Working Capital Requirements as below)

STATEMENT OF WORKING CAPITAL REQUIREMENTS

		Rs.
Current Assets :		
Stock of Raw Materials (6,75,000 × $\frac{1}{12}$)		56,250
Stock of Finished Goods (19,35,000 × $\frac{1}{12}$)		1,61,250
Debtors at Cost (22,05,000 × $\frac{2}{12}$)		3,67,500
Prepaid Sales Promotion Expenses (90,000, × $\frac{1}{4}$)		22,500
Cash in Hand		1,16,250
		7,23,750
Less : Current Liabilities :		
Sundry Creditors (6,75,000 × $\frac{2}{12}$)	1,12,500	
Outstanding Manufacturing Expenses	60,000	
Outstanding Administrative (1,80,000 × $\frac{1}{12}$)	15,000	
Wages Outstanding (5,40,000 × $\frac{1}{12}$)	45,000	2,32,500
Net Working Capital		4,91,250
Add : 15% Margin		73,688
Working Capital Required		5,64,938

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6

Cost Accounting-Basic Concepts

Problem 6.1. The following information has been obtained from the records of a manufacturing company for the period ending 30th June. 1996 :

	Rs.
Cost of raw materials in stocks in June, 1996	60,000
Raw materials purchased in June, 1996	9,00,000
Wages (productive)	4,60,000
Factory overheads	1,84,000
Work–in–progress on 1st June, 1996	24,000
Raw materials in stocks on 30th June, 1996	50,000
Work in progress on 30th June, 1996	30,000
Stock of finished goods on June 1, 1996	1,20,000
Selling and distribution overheads	50,000
Sales	18,00,000
Administration overheads	60,000

You are required to prepare a statement showing the cost of goods produced and cost of goods sold.

Solution :

COST SHEET

for the month of June, 1996

	Rs.	*Rs.*
Materials Consumed		
Raw material on 1st June	60,000	
Add : Purchases during June	9,00,000	
	9,60,000	
Less : Raw materials on 30th June	50,000	9,10,000
Wages (productive)		4,60,000
Prime Cost		13,70,000
Factory Overheads		
Add : Work-in-progress on 1st June	1,84,000	
	24,000	
	2,08,000	
Less : Work-in-progress on 30th June	30,000	1,78,000
Works Cost		15,48,000
Administrative overheads		60,000
Cost of Production		16,08,000
Add : Opening stock		1,20,000
Cost of goods sold		17,28,000
Selling and distribution overheads		50,000
Cost of Sales		17,78,000
Profit		22,000
Sales		18,00,000

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Problem 6.2 On 31st July, 1995 a carpet manufacturer desired to quote for contract for the supply of 2,000 carpets. From the following particulars, prepare a statement showing the price to be quoted to give the same percentage of net profit on the turnover as was realised during the six months ending 30th June. 1995 :

	Rs.
Stock of materials on 1st January, 1995	2,00,000
Stock of materials on 30th June, 1995	28,000
Purchases of materials during six months	3,00,000
Factory wages during six months	6,00,000
Indirect wages during six months	1,00,000
Sales during six months	10,80,000
Stock of finished carpets on 1.1.95	Nil
Stock of finished carpets on 30.6.95	2,00,000

The number of carpets manufactured during the six months was 24,000 including those sold and those in stock at the close of the period. The carpets to be quoted are of a uniform size and quality similar to those manufactured during the six months to 30th June, 1995. As from 1st July 1995, the cost of factory labour has increased by 10% and of materials by 5%.

Solution :

COST SHEET

Carpets Manufactured : 24,000

		Rs.	*Rs.*
	Materials Consumed :		
	Opening stock of materials	2,00,000	
Add :	Purchases	3,00,000	
		5,00,000	
Less :	Closing stock of materials	28,000	4,72,000
Add :	Factory Wages		6,00,000
	Prime cost		10,72,000
	Indirect Wages		1,00,000
	Cost of Production		11,72,000
Add:	Opening stock of finished carpets		
Less :	Closing stock of finished carpets		2,00,000
	Cost of Goods Sold		9,72,000
	Profit		1,08,000
	Sales		10,80,000

STATEMENT OF TENDER

		carpets : 2000
		Rs.
Materials :	$\left(\frac{4,72,000 \times 2,000}{24,000} \times \frac{105}{100}\right)$	41,300.00
Labour :	$\left(\frac{6,00,000 \times 2,000}{24,000} \times \frac{110}{100}\right)$	55,000.00
Prime cost		96,300.00
Indirect Wages :	$\left(\frac{1,00,000 \times 2,000}{24,000}\right)$	8,333.00
Total Cost		1,04,633.33
Profit (10% on sales)		11,625.93
Selling Price		1,16,259.26

Problem 6.3. The following particulars are obtained from the records of a factory :

Material issued	: Rs. 64,000
Wages paid	: Rs. 56,000
Factory overheads	: 60% of wages

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Out of the materials issued Rs. 800 worth of goods have been returned to the stores and Rs. 400 transfered to other jobs. 10% of the production has been scrapped as bad and a further 20% has been brought upto the specification by increasing the factory overhead to 80% of the wages. If the scrapped production fetches only Rs. 470, find the production cost per unit of the finished product if the total production (including the quantity scrapped) be 100 units.

Solution :

COST SHEET

		Rs.
Materials Consumed (64,000–800–400)		62,800
Wages		56,000
Prime Cost		1,18,800
Factory overhead		
On 4/5 th of output at 60% of wages $\left(\frac{60 \times 44,800}{100}\right)$	26,800	
On 1/5th of output, at 80% of wages $\left(\frac{80 \times 11,200}{100}\right)$	8,960	35,840
		1,54,640
Less : Sale proceeds of scrapped production		470
Factory cost of 90 units		1,54,170
Factory Cost per Unit $\left(\frac{1,54,170}{90}\right)$		1,713

Problem 6.4. A factory has received an order for three different types of casting weighing respectively 18, 45 and 27 tons. 10% of the raw materials used are wasted in manufacturing and sold as scrap for 20% the cost price of raw materials. The cost of raw materials is Rs. 250 per ton, the wages for three types of castings are respectiively Rs. 4,000 Rs. 10,500 and Rs. 5,500. The costs of the moulds for the three different types of castings are respectively Rs. 400, Rs. 500 and Rs. 300.

If the factory overhead charged are 40% of the wages in each case, find the cost of production per ton of each type of casting. *(Vikram M. Com. I)*

Solution :

CASTINGS PRODUCED

	A 18 Tons Rs.	*B* 45 Tons Rs.	*C* 27 Tons Rs.
Materials @ Rs. 250 per ton on gross input * (20, 50, 30 tons respectively)	5,000	12,500	7,500
Less : Sale of scrap @ 20% of the cost of materials *i.e.*, Rs. 50 per ton	100	250	150
Cost of materials used	4,900	12,250	7,350
Wages	4,000	10,500	5,500
Cost of moulds	400	500	300
Prime Cost	9,300	23,500	13,150
Factory Overhead : 40% of wages	1,600	4,200	2,200
Cost of Production	10,900	27,450	15,350
Cost of Production per ton	605.56	610.00	568.52

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* Net weight of Casting is 90% as 10% raw material is wasted. Gross weight of A : $\frac{18 \times 100}{90}$ = 20 tons ; B : $45 \times \frac{100}{90}$ = 50 tones ; C : $\frac{27 \times 100}{90}$ = 30 tons.

Problem 6.5. Following are the particulars for the production of 2,000 sewing machines of Nath Engineering Co. Ltd., for the your 1995.

Cost of materials Rs. 1,60,000 ; Wages Rs. 2,40,000 ; Manufacturing expenses Rs. 1,00,000 ; Salaries Rs. 1,20,000 ; Rent, Rates and Insurance Rs. 20,000 ; Selling expenses Rs. 60,000 ; General expenses Rs. 40,000 and Sales Rs. 8,00,000.

The company plans to manufacture 3,000 sewing machines during 1996. You are required to submit a statement showing the price at which machines would be sold so as to show a profit of 10% on selling price. The following additional information is supplied to you.

(a) Price of material is expected to rise by 20% *(b)* Wages are expected to show an increase of 5% ; *(c)* Manufacturing expenses will rise in proportion to the combined cost of materials and wages *(d)* Selling expenses per unit will remain the same ; *(e)* Other expenses will remain unaffected by the rise in output. *(M. Com. Panjab)*

Solution :

STATEMENT OF COST AND PROFIT FOR THE MANUFACTURE OF 2,000 SEWING MACHINES

for the year ended Dec. 31, 1995

	Total cost	*Cost per Unit (machine)*
	Rs.	*Rs.*
Materials	1,60,000	80.00
Direct wages	2,40,000	120.00
Prime Cost	4,00,000	200.00
Manufacturing expenses	1,00,000	50.00
Workes Cost	5,00,000	250.00
Administrative expenses ;		
Salaries	1,20,000	60.00
Rent, Rates & Insurance	20,000	10.00
General expenses	40,000	20.00
Cost of Production	6,80,000	340.00
Selling expenses	60,000	30.00
Cost of Sales	7,40,000	370.00
Profit	60,000	30.00
Selling Price	8,00,000	400.00

ESTIMATED COST FOR THE MANUFACTURE OF 3,000 SEWING MACHINES DURING THE YEAR 1996

		Total Cost	*Cost per machine*
		Rs.	*Rs.*
Materials	80		
Add : 20% increase	$\left(\frac{80 \times 20}{100}\right)$ 16	2,88,000	96.00

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Direct Wages	120		
Add : 5% increse $\left(\frac{120 \times 5}{100}\right)$	6	3,78,000	126.00
Prime Cost		6,66,000	222.00
Manufacturing expenses		1,66,500	55.50
$\left(\frac{50}{200} \times 222\right)$			
Works cost		8,32,500	277.50
Administrative expenses :			
(unaffected by rise in output)			
Salaries		1,20,000	40.00
Rent, Rates & Insurance		20,000	6.67
General expenses		40,000	13.33
Cost of Production		10,12,500	337.50
Selling expenses (per unit the same)		90,000	30.00
Cost of Sales		11,02,500	367.50
Profit (1/9 on Cost)		1,22,500	40.83
Selling Price		12,25,000	408.33

Problem 6.6. The Modern Manufacturing Company submits the following information on 31st March 1996 :

		Rs.
Sales for the year		2,75,000
Inventories at the beginning of the year were :		
Finished goods	Rs. 7,000	
Work-in-Progress	Rs. 4,000	
Purchase of materials for the year were Rs. 1,10,000		
Materials inventory at the beginning of the year was Rs. 3,000 and at the end of the year Rs. 4,000		
Direct labour		65,000
Factory overhead was 60% of direct labour cost.		
Inventories at the end of the year were :		
Work-in-Progress		6,000
Finished goods		8,000
Other expenses for the year were :		
Selling expenses 10% of sales		
Administration expenses 5% of sales		

Prepare statement of Cost. *[C.A. Inter]*

Solution :

Modern manufacturing Company
STATEMENT OF COST
for the year ending 31st March, 1996

	Rs.	*Rs.*
Inventory at the beginning	3,000	
Purchase during the year	1,10,000	
	1,13,000	
Less: Inventory at the end	4,000	
Materials consumed		1,09,000

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	Direct labour		65,000
	Prime Cost		1,74,000
	Factory overheads @ 60% of labour		39,000
			2,13,000
Add :	Work in-progress in the beginning		4,000
			2,17,000
Less :	Work-in-progress at the close		6,000
	Works cost		2,11,000
	Administrative expenses (5% of sales)		13,750
	Cost of Production		2,24,750
Add :	Opening inventory of finished goods		7,000
			2,31,750
Less :	Closing inventory of finished goods		8,000
	Cost of Goods Sold		2,23,750
Add :	Selling expenses : (10% of sales)		27,500
	Cost of Sales		2,51,250
	Profit		23,750
	Sales		2,75,000

Problem 6.7. A factory produces 24,000 units. The cost sheet gives the following information :

	Rs.
Direct materials	2,40,000
Direct wages	1,68,000
Variable Overheads	96,000
Semi-Variable Overheads	56,000
Fixed Overheads	1,60,000
Total Cost	7,20,000

The product is sold at Rs. 40 per unit. The management proposes to increase the production by 3,000 units for sales in the foreign market. It is estimated that the semi-variable overheads will increase by Rs. 2,000. But the product will be sold at Rs. 28 per unit in the foreign market. However, no additional capital expenditure will be incurred. The management seeks your advice as a cost accountant.

What will you advise them ?

Solution :

COST SHEET

	24000 *Units*	3000 *Units*	27000 *Units*
	Rs.	*Rs.*	*Rs.*
Direct Materials	2,40,000	30,000	2,70,000
Direct Wages	1,68,000	21,000	1,89,000
Prime Cost	4,08,000	51,000	4,59,000
Variable Overheads	96,000	12,000	1,08,000
Semi-variable overheads	56,000	2,000	58,000
Fixed Overheads	1,60,000	—	1,60,000
Total Cost	7,20,000	65,000	7,85,000
Profit	2,40,000	19,000	2,59,000
Sales	9,60,000	84,000	10,44,000

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The firm will gain by Rs. 19,000 if the order of 3,000 units is accepted from a foreign concern. The amount of profit is Rs. 2,40,000 when 24,000 units are produced. The profit will go upto Rs. 2,59,000 while 27,000 units are produced. Though the sale price of Rs. 40 per unit is reduced to Rs. 28 per unit for a foreign buyer still the company stands to gain. However, the additional order of 3,000 units should not be accepted if it is from a customer within the country because the company cannot charge two prices in the same market.

Problem 6.8. A factory can produce 60,000 units per annum at its optimum (100%) capacity. The estimated costs of production are as under :

Direct materials	:	Rs. 3 per unit
Direct labour	:	Rs. 2 per unit, subject to a minimum of Rs. 6,000 per month.
Overhead expenses	:	
Fixed	:	Rs. 1,00,000 per annum
Variable	:	Rs. 2 per unit
Semi-variable	:	Rs. 40,000 per annum upto 50% capacity and an additional Rs. 10,000 for every 20% increase in capacity or part thereof.

Each unit of raw material yields scrap, which is sold at the rate of 20 paise per unit.

In 1994 the factory worked at 50% capacity for the first three months but it was expected that it would work at 80% capacity for the remaining nine months.

During the first three months the selling price per unit was Rs. 12. What should be the price for the remaining nine months to produce a total profit of Rs. 1,00,000.

Solution :

COST SHEET FOR THE YEAR 1994

Items	*First three months Output : 7,500 Units*		*Remaining nine months Output : 36,000 Units*	
	Per Unit Cost	*Total Cost*	*Per Unit Cost*	*Total Cost*
	Rs.	*Rs.*	*Rs.*	
Direct materials	3.00	22,500	3.00	1,08,000
Less : Sale of scrap 0.20 p. per unit	0.20	1,500	0.20	7,200
	2.80	21,000	2.80	1,00,800
Direct Labour (Minimum charges in 1st period and per unit in the 2nd period)	2.40	18,000	2.00	72,000
Prime Cost	5.20	39,000	4.80	1,72,800
Overhead expenses :				
Variable	2.00	15,000	2.00	72,000
Semi-Variable $\left(40{,}000 \times \frac{3}{12}\right)$	1.33	10,000		
$\left(60{,}000 \times \frac{9}{12}\right)$			1.25	45,000
Fixed (on the basis of time *i.e.* 3 months and 9 months)	3.34	25,000	2.08	75,000
Total Cost	11.87	89,000	10.13	3,64,800
Profit	0.13	1,000	2.75	99,000
Sales	12.00	90,000	12.88	4,63,800

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Problem 6.9. The cost structure of an article, the selling price of which is Rs. 500, is as follows :

Direct material	: 50% of the total cost
Direct labour	: 30% of the total cost
Overhead	: Balance

Due to anticipated increase in existing material price by 20% and the existing labour rate by 10%, the existing profit would come down by 30% if the selling price remains unchanged.

Prepare a comparative statement showing the cost, profit and sale price under the present conditions and with the increase expected for the future assuming the same percentage of profit on cost as under present conditions had to be earned. Calculations are to be made nearest to the rupee.

Solution :

Selling price = Rs. 500
Let total cost be Rs. x

	Present Condition		*Anticipated Condition*
Direct material	$0.5x$	+20%	$0.6x$
Direct labour	$0.3x$	+ 10%	$0.33x$
Overhead	$0.2x$		$0.2x$
Total	$1.0x$		$1.13x$

Profit = $(500 - x) - (500 - 1.13x)$

$(500 - x) - (500 - 1.13x) = 30\%$ of $(500 - x)$

$-x + 1.13x = 150 - .3x$

$.43x$ = Rs. 150 (approx.)

x = Rs. 350 and profit Rs. 150

COMPARATIVE STATEMENT OF COST, PROFIT AND SALE PRICE

	Present Condition	*Future Anticipation*	
		Sale Price Unchanged	*Sale Price Increased*
	Rs.	*Rs.*	*Rs.*
Sale Price (per unit)	500	500	565
Direct material	175	210	210
Direct Labour	105	115	116
			(app.)
Overhead	70	70	70
Total Cost	350	395	396
Profit	150	105	169

Problem 6.10. Mody & Co.'s Pig Iron production for the quarter ending 31st March 1996 amounted to 32,000 tons. The standard cost of production (*i.e.*, the price charged by Production Account to Trading Account) of one ton of pig iron is Rs. 21.

From the particulars given below prepare a Trading Account and a Production Account Showing profit on production and cost per ton of each item of expenditure.

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	Stock on 1.1.1996	*Purchases during the quarter*	*Stock on 31.3.1996*
	Rs.	*Rs.*	*Rs.*
Lime stone	3,100	42,300	5,400
Coal and Coke	17,400	2,93,500	14,900
Iron ore	14,600	1,67,200	17,800
	Stock on 1.1.96	*Sales during the quarter*	*Stock on 31.3.96*
	Rs.	*Rs.*	*Rs.*
Pig Iron	2,97,000	10,33,000	2,99,000

Other production expenses during the quarter were

	Rs.
Furnace Wages	92,000
Carriage Inwards	22,000
Furnace Repairs	26,000

Solution :

PRODUCTION ACCOUNT

for the quarter ending 31st March, 1996

	Cost per ton Rs.	*Amount Rs.*		*Cost per ton Rs.*	*Amount Rs.*
To Material used :			By Transfer to		
Limestone	1.25	40,000	Trading Account		
Coal and Coke	9.25	2,96,000	at Rs. 21 per		
Iron Ore	5.12	1,64,000	ton (32,000 tons)	21.00	6,72,000
To Carriage Inwards	0.69	22,000			
To Furance wages	2.88	92,000			
To Furnace Repairs	0.81	26,000			
To Profit on Production	1.00	32,000			
	21.00	6,72,000		21.00	6.72,000

TRADING ACCOUNT

	Rs.		*Rs.*
To Stock on 1.1.96	2,97,000	By Sales	10,33,000
To Production Account	6,72,000	By Stock on 31.3.96	2,99,000
To Gross Profit	3,63,000		
	13,32,000		13,32,000

Problem 6.11. From the following information in respect of semi-variable costs of a firm, segregate the cost into fixed and variable elements by various methods :

	Production in Units	*Semi-Variable cost*
July, 1995	100	Rs. 3000
August	50	2500
September	80	2800
October	150	3500
November	200	4000
December	300	5000

Solution :

1. **Comparison Method**

$$\text{Variable Cost per unit} = \frac{\text{Change in the amount of semi-variable cost}}{\text{Change in volume of output}}$$

Taking the level of activity of any two months, say October and December, the variable and fixed element of cost may be calculated as follows :

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Month	Production (Units)	S. V. Cost (Rs.)	Variable Element (Rs.)	Fixed Element (Rs.)
October, 1995	150	3500	1,500	2,000
November	200	4,000	2,000	2,000
Change	50	500		

$$\text{Variable Element of Cost per unit} = \frac{\text{Change in S.V. Cost}}{\text{Change in Volume of Production}}$$

$$= \frac{500}{50} = \text{Rs. 10 per unit}$$

Therefore, Variable Element of Cost for Oct. = 150 × 10 = Rs. 1500
and, Fixed Element of Cost for Oct = Rs. 3500 – 1500 = Rs. 2,000
Similarly, Variable Cost for November = 200 × 10 = Rs. 2,000

2. **The High and Low Points or Range Method**

The highest level of activity, in the given problem, is achieved in the month of December and the lowest in the month of August, and hence data of these two companies is considered, as below :

Month	Production (Units)	S.V. Cost (Rs.)	Variable Element (Rs.)	Fixed Element (Rs.)
August, 1995	50	2,500	500	2,000
December	300	5,000	3,000	2,000
Change	250	2500		

$$\text{Variable cost per unit} = \frac{\text{Change in S.V. Cost}}{\text{Change in Output}}$$

$$= \frac{2500}{250} = \text{Rs. 10 per unit}$$

For August, 1995, Variable Element of Cost = 50 × 10 = Rs. 500
and, Fixed Element of cost = Rs. 2,500 – 500 = Rs. 2,000
For December, 1995, Variable Element = 300 × 10 = Rs. 3,000
and Fixed Element = Rs. 5000 – 3000 = Rs. 2,000

3. **The Equation Method** $y = mx + c$

Where, y = Total S.V. Cost
x = Output (in units)
m = Variable Cost per unit
C = Fixed Cost element

For July, the equation would be : Rs. 3,000 = 100 m + c ..... *(i)*
and for August, the equation be : Rs. 2500 = 50 m + c ..... *(ii)*

Subtracting *(ii)* from *(i)*, 500 = 50 m

Or, m (Variable cost) = Rs. 10 per unit
Now, substituting the value of m in equation *(i)*,
3000 = 100 × 10 + C or, C = Rs. 2000 or, Fixed Cost = Rs. 2,000

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7

Marginal Costing & Break-Even Analysis (Cost-Volume Profit Analysis Including Decisions Involving Alternative Choices)

Problem 7.1. Break-down of cost per unit at an activity level of 10,000 units of Zenith Razors is as follows :

	Rs.
Raw materials	10
Direct expenses	8
Chargeable expenses	2
Variable overheads	4
Fixed overheads	6
Total cost per unit	30
Selling price	32
Profit per unit	2

How many units must be sold to break-even ?

Solution :

	Rs.	*Rs.*
Selling Price per unit		32
Less : Variable Cost :		
Raw Materials	10	
Direct Expenses	8	
Chargeable expenses	2	
Variable overheads	4	
		24
Contribution per unit		8

Fixed Cost = Rs. 6 per unit

Level of Activity = 10,000 units

Total Fixed Cost = Rs. 10,000 × 6 = Rs. 60,000

Break-even Point

$$\text{(B.E.P.)} = \frac{\text{Fixed Cost}}{\text{Contribution per unit}}$$

$$= \frac{60{,}000}{8}$$

= 7,500 units.

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Proof. Sales at 7,500 units = 7,500 × 32 = Rs. 2,40,000
Variable Cost of 7,500 units = 7,500 × 24 = 1,80,000
Add : fixed Cost = 60,000
Total Cost Rs. 2,40,000

So, Total cost is equal to total sales at 7,500 units.

Problem 7.2. From the following data calculate :

(i) P/V ratio

(ii) Profit when sales are Rs. 20,000, and

(iii) New break-even point if selling price is reduced by 20%.

	Rs.
Fixed expenses	4,000
Break-even point	10,000

Solution :

Break-even point = Rs. 10,000

Fixed Expenses = Rs. 4,000

As B.E.P. is that level of activity/sales at which total cost is equal to total sales value or when contribution is equal to fixed expenses, so Contribution = Fixed Expenses = Rs. 4,000.

(i) $\text{P/V Ratio} = \frac{\text{Contribution}}{\text{Sales}} \times 100$

$= \frac{4,000}{10,000} \times 100$

$= 40\%$

(ii) When sales are Rs. 20,000, contribution will be

$$20,000 \times \frac{40}{100} = \text{Rs. } 8,000.$$

As, Sales – Variable Cost = Fixed Expenses + Profit
or, Contribution – Fixed Expenses = Profit
or, Profit = Rs. 8,000 – 4,000 = Rs. 4,000.

(iii) New B.E.P. if selling price is reduced by 20%.
Present P/V ratio = 40%
When sales are 20,000, contribution = Rs. 8,000
or variable cost = 12,000
If selling price is reduced by 20%,
New sales will be 20,000–20% = Rs. 16,000
Contribution will be = Rs. 16,000 – 12,000 = Rs. 4,000

$$\text{New P/V Ratio} = \frac{4,000}{16,000} \times 100 = 25\%$$

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$$\text{Hence, New B.E.P.} = \frac{\text{Fixed Cost}}{\text{New P/V Ratio}}$$

$$= \frac{4,000}{25\%}$$

$$= \frac{4,000 \times 100}{25}$$

$$= \text{Rs. } 16,000.$$

Problem 7.3. The sales of Forma Ltd. in the first half of 1995 amounted to Rs. 2,70,000 and profit earned was Rs. 7,200. The sales in the second half year registered an increase and amounted to Rs. 3,42,000. The profit earned was Rs. 20,700 in the half year. Assuming no change in fixed costs, calculate *(i)* the profit-volume ratio, *(ii)* the amount of profit when sales are Rs. 2,16,000 and *(iii)* the amount of sales required to earn a profit of Rs. 36,000.

Solution :

(i) $$\text{P/V Ratio} = \frac{\text{Contribution}}{\text{Sales}} \times 100$$

$$= \frac{\text{Change in Contribution}}{\text{Change in Sales}} \times 100$$

$$= \frac{\text{Change in Profit}}{\text{Change in Sales}} \times 100$$

$$= \frac{20,700 - 7,200}{3,42,000 - 2,70,000} \times 100$$

$$= \frac{13,500}{72,000} \times 100$$

$$= 18.75\%$$

(ii) Profit when Sales are Rs. 2,16,000

To calculate the profit, it is necessary to find out the fixed expenses.

P/V ratio = 18.75%

So, when sales are Rs. 2,70,000 contribution will be

$$= \text{Rs. } 2,70,000 \times 18.75\%$$

$$= \text{Rs. } 2,70,000 \times \frac{18.75}{100}$$

$$= \text{Rs. } 50,625.$$

Profit at sales of Rs. 2,70,000. = Rs. 7,200

Fixed Expenses = Contribution – Profit

= Rs. 50,625 – 7,200

= Rs. 43,425.

When sales are Rs. 2,16,000 contribution will be

$$= \text{Rs. } 2,16,000 \times 18.75\%$$

$$= \text{Rs. } 2,16,000 \times \frac{18.75}{100}$$

$$= \text{Rs. } 40,500$$

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Fixed Expenses = Contribution – Profit

or, $43,425 = 40,500 - \text{Profit}$

or, $\text{Profit} = 40,500 - 43,425$

$= \text{Rs. } (-) 2,925 \text{ (Loss)}$

(iii) Sales required to earn a profit of Rs. 36,000.

$$= \frac{\text{Fixed Expenses + Profit}}{\text{P/V Ratio}}$$

$$= \frac{\text{Rs. } 43,425 + 36,000}{18.75\%}$$

$$= \frac{79,425}{\frac{75}{4\%}}$$

$$= \frac{79,425 \times 400}{75}$$

$= \text{Rs. } 4,23,600.$

Problem 7.4. There are two similar plants under the same management. The management desires to merge these two plants. The following particulars are available.

	Factory I	*Factory II*
Capacity operation	100%	60%
	(Rs. lacs)	(Rs. lacs)
Sales	600	240
Variable costs	440	180
Fixed costs	80	40

You are required to calculate *(a)* the capacity of the merged plant to be operated for the purpose of break-even, and *(b)* the profitability on working at 75% of the merged capacity.

Solution :

STATEMENT OF PROFITABILITY AT 100% CAPACITY

	Factory I Rs. (lacs)	*Factory II* Rs. (lacs)	*Total* Rs. (lacs)
Sales	600	400 $\left(240 \times \frac{100}{60}\right)$	1000
Variable Costs	440	300 $\left(180 \times \frac{100}{60}\right)$	740
Contribution (Sales — V.C.)	160	100	260
Fixed Costs	80	40	120
P/V Ratio $\left\{\frac{\text{Contribution}}{\text{Sales}} \times 100\right\}$	$\frac{160}{600} \times 100$	$\frac{100}{400} \times 100$	$\frac{260}{1000} \times 100$
Or. P/V Ratio	26.7%	25%	26%

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$$\text{Break-even sales} = \frac{\text{Fixed Cost}}{\text{P/V Ratio}}$$

Break–even sales (for merged plant) $= \frac{120}{26\%}$

$= 120 \times \frac{100}{26}$

= Rs. 461.54 lacs.

Break–even point (as a%age of capacity)

$= \frac{461.54}{1000} \times 100$

= 46.16%

(b) PROFITABILITY ON WORKING AT 75% OF MERGED CAPACITY

Sales at 75% capacity $= 1000 \times \frac{100}{75}$ = Rs. 750 lacs.

Contribution $= 260 \times \frac{75}{100}$ = Rs. 195 lacs.

Fixed Costs = Rs. 120 lacs.

Profit

= Rs. 195 – 120

= Rs. 75 lacs.

Percentage of Profit of Sales

$= \frac{75}{750} \times 100$

= 10%

Problem 7.5 Calculate from the following data (i) value of the output at which the business breaks even and *(ii)* the percentage of capacity at which it breaks even :

	Budget for the Year 1993 based on 100% capacity	*Estimated shut down Expenditure*
	Rs.	*Rs.*
Direct wages	2,09,694	
Direct materials	2,44,552	
Works expenses	1,81,820	93,528
Administrative expenses	30,000	20,508
Selling & distribution expenses	61,188	40,188
Net Sales	8,40,000	

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Solution :

MARGINAL COST STATEMENT

	(1) Total Budgeted Cost	(2) Fixed Shut down expenses	(3) Variable Expenses (1–2)
	Rs.	Rs.	Rs.
Direct Wages	2,09,964	—	2,09,964
Direct Materials	2,44,552	—	2,44,552
Works expenses	1,81,820	93,528	88,292
Administrative expenses	30,000	20,508	9,492
Selling and Distribution expenses	61,188	40,188	21,000
Total	7,27,524	1,54,224	573,300
Sales	8,40,000		
Profit	1,12,476		

$$\text{P/V Ratio} = \frac{\text{Contribution}}{\text{Sales}} \times 100$$

$$= \frac{\text{Profit + Fixed Expenses}}{\text{Sales}} \times 100$$

$$= \frac{1,12,476 + 1,54,224}{8,40,000} \times 100$$

$$= 31.75\%$$

(i) Sales at Break–even Point

$$= \frac{\text{Fixed Expenses}}{\text{P/V Ratio}}$$

$$= \frac{1,54,224}{31.75} \times 100$$

$$= \text{Rs. } 4,85,745$$

(ii) B.E.P. (in %age of capacity)

$$= \frac{4,85,745}{8,40,000} \times 100$$

$$= 57.83\%$$

Problem 7.6 Ambitious enterprises is currently working at 50% capacity and produces 10,000 units.

At 60% working, raw material cost increases by 2% and selling price falls by 2%. At 80% capacity, raw material cost increases by 5% and selling price falls by 5%.

At 50% working capacity, the product costs Rs. 180 per unit and is sold at Rs. 200 per unit.

The unit cost of Rs. 180 is made up as follows :

	Rs.
Materials	100
Wages	30

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Factory overhead 30 (40% fixed)
Administration overhead 20 (50% fixed)

Prepare a marginal cost statement showing the estimated profit at 60% and 80% capacity.

Solution :

MARGINAL COST STATEMENT

		60% Capacity Output = 10,000 × 60/50 = 12,000 units		*80% Capacity* Output = 10,000 × 80/50 = 16,000 units	
		Per unit	*Total*	*Per unit*	*Total*
		Rs.	Rs.	Rs.	Rs.
(a)	Sales	196 (200–2% of 200)	23,52,000 (196 × 12,000)	190 (200–5% of 200)	30,40,000 (190 × 16,000)
(b)	Marginal Cost :				
	Materials	102 (100 + 2%)	12,24,000	105 (100 + 5%)	16,80,000
	Wages	30	3,60,000	30	4,80,000
	Variable Factory Overheads	18 (60% of 18)	2,16,000	18	2,88,000
	Variable Administrative overheads	(50% of 20)	1,20,000	10	1,60,000
	Total marginal Cost	160	19,20,000	163	26,08,000
(c)	Contribution (a–b)	36	4,32,000	27	4,32,000
(d)	Fixed Costs :				
	Fixed Factory Overheads	10	1,20,000	7,50	1,20,000
	Fixed Administrative Overheads	8.33	1,00,000	6.25	1,00,000
		18.3	2,20,000	13.75	2,20,000
(e)	Net Profit (c–d)	17.67	2,12,000	13.25	2,12,000

Problem 7.7 *(a)* A company has fixed expenses of Rs. 90,000 with sales at Rs. 3,00,000 and a profit of Rs. 60,000. Calculate the Profit-Volume ratio. If in the next period, the company suffered a loss of Rs. 30,000, calculate the sales volume.

(b) What is the margin of safety for a profit of Rs. 60,000 in (a) above.

Solution :

(a) Profit/Volume (P/V) Ratio

$$= \frac{\text{Contribution}}{\text{Sales}} \times 100$$

Contribution = Fixed Expenses + Profit
= Rs. 90,000 + Rs. 60,000
= Rs. 1,50,000

$$\text{P/V Ratio} = \frac{1,50,000}{3,00,000} \times 100 = 50\%$$

In the next period the company suffered a loss of Rs. 30,000. It means the total contribution the company is in a position to recover is :

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$$S - V = F + P \text{ (—Loss)}$$
$$S - V = \text{Rs. } 90,000 - 30,000$$

or Contribution = Rs. 60,000

As P/V ratio is 50%, so sales are

$$= 60,000 \times \frac{100}{50}$$
$$= \text{Rs. } 1,20,000$$

(b) Margin of Safety :

Margin of Safety

$$= \frac{\text{Profit}}{\text{P/V Ratio}}$$
$$= \text{Rs. } \frac{60,000}{50\%}$$
$$= \text{Rs. } 1,20,000$$

Margin of safety can also be calculated as :

Margin of Safety = Present Sales-Break Even Sales

Break Even Sales

$$= \frac{F}{\text{P/V Ratio}}$$
$$= \frac{90,000}{50\%}$$
$$= \text{Rs. } 1,80,000$$

Margin of Safety = Rs. 3,00,000 – Rs. 1,80,000
= Rs. 1,20,000.

Problem 7.8. A farmer owns an orchard which has an area of 300 acres on which he grows apples, apricots, cherries and pulms. Of the total area, 200 acres of land are unsuitable for growing apples or plums and are suitable only for apricots and cherries. On the remaining 100 acres of land, any of the four fruits can be grown. The marketing policy requires that in each season all the four types of fruits must be produced and the quantity of any one type should not be less than 12,000 boxes. it is essential that the area devoted to any one should be in terms of complete acres and not in fraction of an acre. There are no physical or marketing limitations and there is an adequate supply of all types of labour. The details regarding the selling price, production and costs are given below :

	Apples	Apricots	Cherries	Plwns
Selling price, per box (in Rs.)	10	10	20	30
Season's yield in boxes (Per acre)	500	150	100	200
Weight per box (kg)	30	30	40	20
Cost (Rs.) :				
Material, per acre (Rs.)	180	70	60	100
Labour :				
Growing, per acre (Rs.)	200	150	100	130
Harvesting and packing per box	1	1	2	3
Transport ; per box	2	2	1	3
Fixed overhead each season :				

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	Rs.
Cultivating and growing	28,000
Harvesting	21,000
Transport	5,000
Administration	42,000
Land Revenue	9,000

Advise the farmer on the area to be allotted to each item in order to earn the maximum total profit and also find out the total profit.

Solution :

MARGINAL COST STATEMENT

		Apples	*Apricots*	*Cherries*	*Plums*
		Rs.	*Rs.*	*Rs.*	*Rs.*
(a)	Sales Price per acre (Pricex boxes)	5,000 (500×10)	1,500 (150×10)	2,000 (100×20)	6,000 (200×30)
(b)	Marginal cost :				
	Material-per acre	180	70	60	100
	Labour				
	Growing	200	150	100	130
	Harvesting & Packing (Rates Boxes)	500	150	200	600
	Transport per acre (Rate Boxes)	1,000	300	100	600
	Total Marginal cost	1,880	670	460	1,430
(c)	Contribution (A–B)	3,120	830	1,540	4,570

From the Marginal cost statement we find that cherries give the lowest contribution and hence must be grown to the minimum possible. As all the fruits are to be grown and none should be less than 12,000 boxes, we should grow 12,000 boxes of cherries for which 120 acres of land is needed at the rate of 100 boxes per acre. Then, next minimum contribution is from Apricots. Again, we have to grow 12,000 boxes for which 80 acres of land is needed at the rate of 150 boxes per acre. Now, we are left with 100 (300–120–80) acres of land which can be utilised to grow Apples and Plums. Maximum land we can utilise for these fruits is also 100 acres (given). Third lowest contribution is from Apples and we have to produce 12,000 boxes minimum. For this 24 acres of land is needed at the rate of 500 boxes per acre. The rest of the land must be utilised to grow Plums which gives the highest contribution. Hence, land which should be used to grow Plums is 76 acres (100–24).

CALCULATION OF TOTAL MAXIMUM PROFIT

		Apples	*Apricots*	*Cherries*	*Plums*	*Total*
1.	Land in Acres	24	80	120	76	300
2.	Produce per acre (boxes)	500	150	100	200	950
3.	Total Produce (1 × 2)	12,000	12,000	12,000	15,200	51,200
4.	Contribution per acre (Rs.) (as calculated in marginal cost statement)	3,120	830	1,540	4,570	---
5.	Total contribution (Rs.)	74,880 (3,120×24)	66,400 (830×80)	1,84,800 (1,540×120)	3,47,320 (4,570×76)	6,73,400

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	Rs.
Total Contribution	6,73,400
Less : Fixed Cost (1)	1,05,000
Profit	5,68,400

(1) *Fixed Cost*

	Rs.
Cultivating and growing	28,000
Harvesting	21,000
Transport	5,000
Administration	42,000
Land Revenue	9,000
	1,05,000

Problem 7.9. ABC Ltd. manufactures and sells four types of products under the brand names of P, Q, R and S. The sales mix in value comprises of $33^1/_3$%, $41^2/_3$%, $16^2/_3$ and $8^1/_3$% of products P, Q, R and S respectively. The total budgeted Sales (100%) are Rs. 60,000 per month. Operating costs are :

Variable costs : Product : P 60% of the selling price
Q 68% of the selling price
R 80% of the selling price
S 40% of the selling price

Fixed cost Rs. 14,700 per month.

Calculate the break-even point for the products on an over-all basis.

Solution :

CALCULATION OF BREAK-EVEN POINT

Products	*P*	*Q*	*R*	*S*	*Total*
Sales Mix	$33^1/_3$%	$41^2/_3$%	$16^2/_3$%	$8^1/_3$%	100%
	Rs.	*Rs.*	*Rs.*	*Rs.*	*Rs.*
Sales	20,000	25,000	10,000	5,000	60,000
Variable Cost	12,000 (60% of 20,000)	17,000 (68% of 25,000)	8,000 (80% of 10,000)	2,000 (40% of 5,000)	39,000
Contribution (Sales–V.C.)	8,000	8,000	2,000	3,000	21,000

$$\text{P/V Ratio} = \frac{\text{Contribution}}{\text{Sales}} \times 100$$

$$= \frac{21,000}{60,000} \times 100$$

$$= 35\%$$

$$\text{Break–even point} = \frac{\text{Fixed Cost}}{\text{P/V Ratio}}$$

$$= \frac{14,700}{35} \times 100$$

$$= \text{Rs. } 42,000.$$

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Problem 7.10. The following figures of sales and profits for two periods are available in respect of a concern :

	Sales	*Profit*
	Rs.	*Rs.*
Period I	1,00,000	15,000
Period II	1,20,000	23,000

You are required to find out :

(a) P/V ratio

(b) Fixed cost

(c) Break-even point

(d) Profit at an estimated sale of Rs. 1,25,000.

(e) Sales required to earn a profit of Rs. 20,000.

Solution :

	Period I	*Period II*	*Increase*
	Rs.	*Rs.*	*Rs.*
Sales	1,00,000	1,20,000	20,000
Profit	15,000	23,000	8,000

(a) P/V Ratio $= \frac{\text{Contribution}}{\text{Sales}} \times 100$

$= \frac{\text{Change in Contribution}}{\text{Change in Sales}} \times 100$

$= \frac{\text{Change in Profit}}{\text{Change in Sales}} \times 100$

$= \frac{8,000}{20,000} \times 100$

$= 40\%$

Sales – Variable Cost = Fixed Expenses + Profit

or 1,00,000 – 60,000 = Fixed Cost + 15,000

(60% of sales as P/V ratio is 40%)

(b) or, Fixed Cost = 1,00,000 – 60,000 - 15,000

= Rs. 25,000.

(c) Break-even point $= \frac{\text{Fixed Cost}}{\text{P/V Ratio}}$

$= \frac{25,000}{40} \times 100$

= Rs. 62,500.

(d) Profit at an estimated sale of Rs. 1,25,000.

As, P/V ratio is 40%

Contribution when sales are Rs. 1,25,000 $= 1,25,000 \times \frac{40}{100}$

= Rs. 50,000

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Profit = Contribution – Fixed Cost
= 50,000 – 25,000
= Rs. 25,000.

(e) Sales required to earn a profit of Rs. 20,000.

$$= \frac{\text{Fixed Cost + Desired Profit}}{\text{P/V Ratio}}$$

$$= \frac{25,000 + 20,000}{40\%}$$

$$= 45,000 \times \frac{100}{40}$$

= Rs. 1,12,500.

Problem 7.11 The following information relates to production and sale of an article for January and February 1993 :

	January	*February*
	Rs.	*Rs.*
Sales	38,000	65,000
Profit	—	3,000
Loss	2,400	

Calculate :

(i) Break-even sales volume.
(ii) Profit or loss at Rs. 46,000 sales.
(iii) Sales to earn a profit of Rs. 5,000.

Solution :

	January	*February*	*Increase*
	Rs.	*Rs.*	*Rs.*
Sales	38,000	65,000	27,000
Profit/Loss	–2,400	+3,000	5,400

$$\text{P/V Ratio} = \frac{\text{Change in Profit}}{\text{Change in Sales}} \times 100$$

$$= \frac{5,400}{27,000} \times 100$$

= 20%

Fixed Cost = Sales – Variable Cost – Profit
= Rs. 65,000 – 52,000 – 3,000
(If sales are Rs. 65,000, V.C. is 80% of 65,000 as P/V ratio is 20%)
= Rs. 10,000.

(i) Break-even Sales

$$= \frac{\text{Fixed Cost}}{\text{P/V ratio}}$$

$$= \frac{10,000}{20\%}$$

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$$= \frac{10,000 \times 100}{20}$$

$$= \text{Rs. } 50,000$$

(ii) Profit/Loss at Rs. 46,000 Sales

$$\text{Contribution} = 46,000 \times \frac{20}{100}$$

$$= 9,200.$$

Contribution = Fixed Cost ± Profit/Loss

or, 9,200 = 10,000 — Profit/Loss

or, Loss = Rs. 800.

(iii) Sales to earn a Profit of Rs. 5,000

$$= \frac{\text{Fixed Cost + Profit}}{\text{P/V ratio}}$$

$$= \frac{10,000 + 5,000}{20\%}$$

$$= \frac{15,000}{20} \times 100$$

$$= \text{Rs. } 75,000.$$

Problem 7.12. The competing companies, P. Ltd. and Q. Ltd., produce and sell the same type of product in the same market. For the year ended March 1996 their forecasted profit and loss accounts are as follows :

	P. Ltd.		*Q. Ltd.*	
	Rs.	*Rs.*	*Rs.*	*Rs.*
Sales		3,00,000		3,00,000
Less : Variable Cost	2,00,000		2,25,000	
Fixed Cost	50,000		25,000	
		2,50,000		2,50,000
Estimated Profit		50,000		50,000

You are required to calculate :

(a) Profit volume ratio, break-even point and margin of safety of each business.

(b) State volume at which each business will earn a profit of Rs. 30,000.

(c) Explain giving reasons which business is likely to earn greater profits in the conditions of

(i) heavy demand for the product

(ii) low demand for the product. *[B. Com. Panjab]*

Solution :

(a) **Profit Volume Ratio**

$$= \frac{\text{Contribution}}{\text{Sales}} \times 100$$

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	P. Ltd.	Q. Ltd.
P/V ratio	$= \frac{\text{Fixed Cost + Profit}}{\text{Sales}} \times 100$	$\frac{\text{Fixed Cost + Profit}}{\text{Sales}} \times 100$
	$= \frac{50,000 + 50,000}{3,00,000} \times 100$	$\frac{25,000 + 50,000}{3,00,000} \times 100$
	$= \frac{100}{3}\%$ or 33.333%	25%

Break-even Point

$$= \frac{\text{Fixed Cost}}{\text{P/V ratio}}$$

	P. Ltd.	*Q. Ltd.*
B.E.P.	$\frac{50,000}{\frac{100}{3}\%}$	$\frac{25,000}{25\%}$
	$= \frac{50,000}{\quad} \times 300$	$\frac{25,000}{25} \times 100$
	= Rs. 1,50,000	Rs. 1,00,000

Margin of Safety = Present Sales – Break-even Sales

	P. Ltd	*Q. Ltd*
	Rs.	*Rs.*
Margin of Safety =	Rs. 3,00,000 – 1,50,000	Rs. 3,00,000 – 1,00,000
	= Rs. 1,50,000	Rs. 2,00,000

(b) **Sales volume at a profit of Rs 30,000.**

$$\text{Desired Sales} = \frac{\text{Fixed Cost + Profit}}{\text{P/V Ratio}}$$

Desired Sales =	$\frac{50,000 + 30,000}{\frac{100}{3}\%}$	$\frac{25,000 + 30,000}{25\%}$
	$= \frac{80,000 \times 300}{100}$	$\frac{55,000}{25} \times 100$
	= Rs. 2,40,000	Rs. 2,20,000

(c) (i) In case of heavy demand for the product, a concern with a higher P/V ratio is better because of greater contribution. Hence, P. Ltd. is likely to earn greater profits.

(ii) In case of low demand, Q, Ltd. will be in an advantageus position as break-even point as well as fixed costs are low and further margin of safety is also higher in case of Q. Ltd.

Problem 7.13 From the following data relating to a company, calculate.

(i) The break-even sales ; and

(ii) Sales required to earn a profit of Rs. 6,000 per period.

Period	*Total Sales*	*Total Cost*
	Rs.	*Rs.*
I	42,500	38,700
II	39,200	36,852

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Solution :

	Period I	*Period II*	*Decrease*
	Rs.	*Rs.*	*Rs.*
Sales	42,500	39,200	3,300
Total Cost	38,700	36,852	1,848

When sales have declined by Rs. 3,300, total cost has decreased by Rs. 1,848. Hence.

Ratio of variable cost to sales

$$= \frac{1,848}{3,300} \times 100$$

$$= 56\%$$

So, P/V Ratio = 100 – Variable Cost Ratio

$$= 100 - 56$$

$$= 44\%$$

Calculation of Fixed Cost :

	Rs
Total Cost in Period I	39,200
Less : Variable Cost	
(56% of sales i.e. $\frac{56}{100} \times$ [illegible])	[illegible]
Fixed Cost	[illegible]

(i) Break–even sales $= \frac{\text{Fixed Cost}}{\text{P/V Ratio}}$

$$= \frac{14,900}{44} \times 100$$

= Rs. 33,864.

(ii) Sales required to earn a profit of Rs. 6,000.

$$= \frac{\text{Fixed Cost + Profit}}{\text{P/V Ratio}}$$

$$= \frac{14,900 + 6,000}{44\%}$$

$$= \frac{20,900}{44} \times 100$$

= Rs. 47,500.

Problem 7.14 A company produces and markets industrial containers and packing cases. Due to competition the company proposes to reduce the selling price. If the present level of profit is to be maintained, indicate the number of units to be sold if the proposed reduction in selling price is – *(a)* 5%, *(b)* 10% and *(c)* 15%.

The following additional information is available :

	Rs.	*Rs.*
Present sales (30,000 units)		3,00,000
Variable cost	1,80,000	
Fixed cost	70,000	2,50,000
Net profit		50,000

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Solution :

Present Sales = Rs. 3,00,000

No. of units = 30,000

So, Present Selling Price

$$= \frac{3,00,000}{30,000} = \text{Rs. 10 per unit}$$

Variable Cost = Rs. 1,80,000

Variable Cost per unit

$$= \text{Rs. } \frac{1,80,000}{30,000} = \text{Rs. 6.}$$

Selling Price if reduction is 5%

$$= 10 - \frac{5}{100} \times 10 = \text{Rs. 9.50}$$

Selling Price if reduction is 10%

$$= 10 - \frac{10}{100} \times 10 \text{ Rs. 9.00}$$

Selling Price if reduction is 15%

$$= 10 - \frac{15}{100} \times 10 \text{ Rs. 8.50}$$

Contribution at various reduced prices :

	At 5% Reduction	*At 10%*	*At 15%*
	Rs.	*Rs.*	*Rs.*
Selling Price	9.50	9.00	8.50
Less : Variable Cost	6.00	6.00	6.00
Contribution	3.50	3.00	2.50

The Number of Units to be sold to earn the present level of profits

$$= \frac{\text{Fixed Cost + Desired Profit}}{\text{Contribution per unit}}$$

(a) At 5% reduced price

$$= \frac{70,000 + 50,000}{3.50} = 34,286 \text{ units}$$

(b) At 10% reduced price

$$= \frac{70,000 + 50,000}{3.00} = 40,000 \text{ units}$$

(c) At 15% reduced price

$$= \frac{70,000 + 50,000}{2.50} = 48,000 \text{ units.}$$

Problem 7.15 An analysis of costs of a company led to the following information.

	Variable cost (% of sales)	*Shut-down cost Rs.*
Direct materials	33.6	—
Direct labour	28.4	—
Factory overhead	11.6	1,66,700
Distribution expenses	3.3	63,400
General and Administration expenses	1.1	99,900

Budgeted sales for the next year are Rs. 20,00,0000.

You are required to determine :

(i) the break-even sales volume,

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(ii) the profit at the budgeted sales volume,
(iii) the profit if actual sales *(a)* drop by $12^1/_2\%$, *(b)* increase by 10%
(iv) sales to generate a profit of Rs. 2,20,000.

Solution :

Variable Cost	*% age of sales*
Direct Materials	33.6
Direct Labour	28.4
Factory Overhead	11.6
Distribution expenses	3.3
General and Administrative expenses	1.1
Total Variable Cost	78.0

Contribution = Sales – Variable Cost
= 100 – 78 = 22%

$$\text{P/V Ratio} = \frac{\text{Contribution}}{\text{Sales}} = \frac{22}{100} = 22\%$$

(i) Break–even sales volume

$$= \frac{\text{Fixed Costs (shut–down cost)}}{\text{P/V ratio}}$$

$$= \frac{1,66,700 + 63,400 + 99,900}{\frac{22}{100}}$$

$$= 3,30,000 \times \frac{100}{22}$$

= Rs. 15,00,000.

(ii) Profit at the budgeted sales of Rs. 20,00,000

$$\text{Contribution} = 20,00,000 \times \frac{22}{100} = \text{Rs. } 4,40,000$$

Profit = Contribution – Fixed Cost
= Rs. 4,40,000 – 3,30,000 = Rs. 1,10,000.

(iii) *(a)* Profit if actual sales drop by $12^1/_2\%$:

	Rs.
Budgeted Sales	20,00,000
Less : $12^1/_2$ drop of sales	2,50,000
Actual Sales	17,50,000

Contribution at 17,50,000 of sales $= 17,50,000 \times \frac{22}{100}$
= Rs. 3,85,000

Profit = Contribution – Fixed Costs
Rs. 3,85,000 – 3,30,000
Rs. 55,000.

(iv) *(b)* Profit if actual sales increase by 10%

	Rs.
Budgeted Sales	20,00,000
Add : 10% Increase	2,00,000
Actual Sales	22,00,000

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Contribution $= 22,00,000 \times \frac{22}{100}$

$= \text{Rs. } 4,84,000$

Profit = Contribution – Fixed Costs

= Rs. 4,84,000 – 3,30,000 = Rs. 1,54,000

(iv) Sales to generate a profit of Rs. 2,20,000

$$= \frac{\text{Fixed Cost + Desired Profit}}{\text{P/V ratio}}$$

$$= \frac{3,30,000 + 2,20,000}{\frac{22}{100}}$$

$$= 5,50,000 \times \frac{100}{22}$$

= Rs. 25,00,000.

Problem 7.16 From the following information you are required to :

(i) calculate and present the marginal product cost and contribution per unit.

(ii) state which of the alternative sales mix you would recommend to management and why :

	X	Y
	Rs.	*Rs.*
Selling price, per unit	25	20
Direct material, per unit	8	6
Direct wages	4 hours @ Rs. 1.25 per hour	16 hours @ Re. 0.25 per hour

Fixed overhead – Rs. 750.

Variable overhead – 150% of direct wages.

Alternative sales mix :

(a) 250 units of X and 250 Units of Y.

(b) Nil unit of X and 400 units of Y.

(c) 400 units of X and 100 units of Y.

Solution :

CALCULATION OF MARGINAL PRODUCT COST AND CONTRIBUTION PER UNIT

	X	Y	X *(Per unit)* *Rs.*	Y *(Per unit)* *Rs.*
Selling Price			25.00	20.00
Less : Variable Cost :				
	Rs.	*Rs.*		
Material	8	6		
Wages	6	4		
Variable Overhead 150% of wages	9	6		
			23.00	16.00
Contribution per unit			2.00	4.00

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Contribution at Various Alternatives :

(a) 250 units of X and 250 units of Y

	Rs.
X = 250 × 2	500
Y = 250 × 4	1,000
	1,500

(b) Nil of X and 400 of Y

X = Nil	—
Y = 400 × 4	1,600
	1,600

(c) 400 units of X and 100 units of Y

X = 400 × 2	800
Y = 100 × 4	400
	1,200

As alternative *(b)* i.e. to produce 400 units of Y only gives the highest contribution, it is recommended to produce 400 units of Y only.

Problem 7.17 S.M. Ltd. produces two products and the budget for 60% level of activity for the year 1995–96 gives the following information :

	Product 'A'	*Product 'B'*
	Rs.	*Rs.*
Raw materials. cost per unit	7.50	3.50
Direct labour cost per unit	4.00	3.00
Variable overheads, per unit	2.00	1.50
Fixed overheads, per unit	6.00	4.50
Selling price, per unit	20.00	15.00
Production and sales	4,000 units	6,000 units

The Managing Director, not being satisfied with the projected results as stated above, referred the Budget to the Marketing Director for improvement of the performance. The Marketing Director proposed that the sales quantities of products 'A' and 'B' could each be increased by 50% provided the selling prices were reduced by 5% in the case of product 'A' and 10% in the case of product 'B'. The price reduction should be made applicable to the entire quantity of sales of each of the two products.

Required :

(i) Present the overall profitability under the Original Budget and the Revised Budget after taking the increased sales into consideration.

(ii) Find out over-all break-even sales under the Original Budget and the Revised Budget

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Solution :

PROFITABILITY STATEMENT

		Original A	*Budget* B	*Total*	*Revised* A	*Budget* B	*Total*
	Quantity (units)	4,000	6,000		6,000	9,000	
(a)	Sales	80,000	90,000	1,70,000	1,14,000	1,21,500	2,35,500
(b)	*Less :* Variable cost :						
	Materials	30,000	21,000	51,000	45,000	31,500	76,500
	Wages	16,000	18,000	34,000	24,000	27,000	51,000
	Overheads	8,000	9,000	17,000	12,000	13,500	25,500
	Total V.C.	54,000	48,000	1,02,000	81,000	72,000	1,53,000
	Contribution (a–b)	26,000	42,000	68,000	33,000	49,500	82,500
	Less : Fixed Costs	24,000	27,000	51,000	24,000	27,000	51,000
	Profit	2,000	15,000	17,000	9,000	22,500	31,500

$$\text{P/V Ratio} = \frac{68,000}{1,70,000} \times 100 \qquad \frac{82,500}{2,35,500} \times 100$$

$$= 40\% \qquad 35\%$$

$$\text{Break–even sales} = \frac{\text{Fixed costs}}{\text{P/V Ratio}}$$

$$= \frac{51,000 \times 100}{40} \qquad \frac{51,000 \times 100}{35}$$

$$= 1,27,500 \qquad \text{Rs. } 1,45,715$$

Problem 7.18 The managing Director of X, Y and Z wants your advice on the product mix of the company. He has furnished you the following data :

Data for standard costs per unit

		Product X	*Product Y*	*Product Z*
		Rs.	*Rs.*	*Rs.*
Direct materials		40	30	20
Variable Overhead		2	5	3
Direct labour :				
Department	Rate per hour	Hours	Hours	Hours
1	Rs. 1.00	6	10	5
2	2.00	6	15	11
Data from current budget :				
Product (Number of units per year)		5,000	6,000	10,000
Selling price, per unit		Rs. 78	Rs. 100	Rs. 60
Fixed overheads Rs. 2,00,000.				
Forecast by the sales department of the maximum possible sales during the next year (number of units)		6,000	8,000	12,000

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Note : This type of labour required by Department I is in short supply and it is not possible to increase the manpower of this department beyond its present level.

You are required to present a statement to the Managing Director of the company, showing the most profitable mixture of the products to be made and sold. The statement should give the following information :

(i) The profit expected on the current budgeted production, and

(ii) The profit which could be expected if the most profitable mixture was produced.

Solution :

PROFIT STATEMENT (BUDGETED PRODUCTION)

		Product X	*Y*	*Z*	*Total*
	Units	5,000	6,000	10,000	21,000
		Rs.	*Rs.*	*Rs.*	*Rs.*
(a)	Sales	3,90,000	6,00,000	6,00,000	15,90,000
(b)	Variable cost :				
	Direct Materials	2,00,000	1,80,000	2,00,000	5,80,000
	Direct Wages :				
	Deptt. 1	30,000	60,000	50,000	1,40,000
	Deptt. 2	60,000	1,80,00	2,20,000	4,60,000
	Variable Overheads	10,000	30,000	30,000	70,000
		3,00,000	4,50,000	5,00,000	12,50,000
(c0	Contribution (a–b)	90,000	1,50,000	1,00,000	3,40,000
(d)	Fixed Overheads				2,00,000
(e)	Net Profit				1,40,000
(f)	Variable cost per unit	60	75	50	
(g)	Contribution per unit	18	25	10	
(h)	Contribution per unit of key factor (*i.e.* wages of Deptt. – 1)	300%	250%	200%	Ranking X Y Z

As the key factor is to be utilised fully, production hours should be utilised first on Products X and Y and the balance on Product Z.

Maximum Hours $= 5,000 \times 6 + 6,000 \times 10 + 10,000 \times 5$
$= 1,40,000$

Allocation of Hours :

Product	*Units*	*Hours required of Deptt. 1*	*Total Hours*
X	6,000	6	36,000
Y	8,000	10	80,000
Z	4,800	5	24,000
			1,40,000

PROFITABILITY STATEMENT

	Product X	*Y*	*Z*	*Total*
Units	6,000	8,000	4,800	18,800
	Rs.	*Rs.*	*Rs*	*Rs*
Sales	4,68,000	8,00,000	2,88,000	15,56,000
Variable cost	3,60,000	6,00,000	2,40,000	12,00,000
Contribution	1,08,000	2,00,000	48,000	3,56,000
Fixed overheads				2,00,000
Net Profit				1,56,000

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Problem 7.19 The following figures are extracted from the records of a company. (Rs. in thousands)

	Department				
	1	2	3	4	Total
	Rs.	*Rs.*	*Rs.*	*Rs.*	*Rs.*
Sales	100	200	300	400	1000
Costs :					
Direct Material	40	100	180	290	610
Direct Labour	20	75	90	70	255
Direct Expenses	2	3	4	5	14
Prime Cost	62	178	274	365	879
Overheads :					
Variable	10	15	12	10	47
Fixed	5	10	5	4	24
Total Cost	77	203	291	379	950
Profit/Loss	23	(–) 3	9	–21	50

On the basis of the above information, the management is inclined to discard department 2. What will be your advice to management ?

Solution :

STATEMENT OF COMPARATIVE PROFITABILITY

Departments

(Rs. in thousands)

		1	2	3	4	Total
(a)	Sales	100	200	300	400	1000
(b)	*Less :* Variable Costs :					
	Material	40	100	180	290	610
	Labour	20	75	90	70	255
	Direct Expenses	2	3	4	5	14
	Variable Overhead	10	15	12	10	47
		72	193	286	375	926
(c)	Contribution (a-b)	28	7	14	25	74
(d)	Less : Fixed cost					24
(e)	Net Profit					50

The management should not discard department 2 because it gives a Contribution of Rs. 7,000. Fixed costs are irrelevant. Fixed costs are to be incurred even if production of department 2 is stopped. The following profitability statement (discarding department 2) will support the same view :

PROFITABILITY STATEMENT

Departments

(Rs. in thousands)

		1	3	4	Total
(a)	Sales	100	300	400	800
(b)	*Less :* Variable Costs :				
	Direct Material	40	180	290	510
	Direct Labour	20	90	70	180
	Direct Expenses	2	4	5	11
	Variable Overheads	10	12	10	32
		72	286	375	733
(c)	Contribution (a–b)	28	14	25	67
(d)	*Less :* Fixed Costs	—	—	—	24
(e)	Net Profit				43

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Net Profit has been reduced from Rs. 50,000 to Rs. 43,000 by discarding department 2 ; hence production of department 2 should not be discarded. But in case, fixed cost of department 2 can be avoided, only then production of department 2 should be discarded.

Problem 7.20. Your directors are contemplating the purchase of a new machine to replace an old one which has been in the factory for 5 years. From the following information prepare a statement for submission to the Board of Directors showing the effect of installation on costs and profits, and comment on the results shown. Ignore interest.

	Old Machine	*New Machine*
Purchase Price	Rs. 40,000	Rs. 60,000
Estimated Life of Machine	10 Years	10 Years
Machine running hours per annum	2,000	2,000
Units produced per hour	24	36
	Rs.	Rs.
Wages per running hour	30	52.50
Power per annum	2,000	4,500
Consumable Stores per annum	6,000	7,500
All other charges per annum	8,000	9,000
Material Cost, per unit	5	5
Selling price per unit	12.50	12.50

Solution :

COMPARATIVE COST STATEMENT

	Old Machine	*New Machine*
Purchase Price	Rs. 40,000	Rs. 60,000
Estimated Life	10 Years	10 Years
Annual Depreciation	Rs. 4000	Rs. 6,000
Units produced per hour	24	36
Machine Running Hours (per annum)	2,000	2,000
Units produced per annum	48,000	72,000
Annual Costs :	*Rs.*	*Rs.*
Material @ Rs. 5 per unit	2,40,000	3,60,000
Wages @ Rs. 30 per hour	60,000	1,05,000
Power	2,000	4,500
Consumable Stores	6,000	7,500
Other Charges	8,000	9,000
	3,16,000	4,86,000
Depreciation	4,000	6,000
Total Cost	3,20,000	4,92,000
Total Cost per unit	3,20,000	4,92,000
	48,000	72,000
	= 6.666	= 6.833
Selling Price	12.500	12.500
Profit per unit	5.834	5.667

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If new machine is installed, the total cost per unit increases from Rs. 6.666 per unit to Rs. 6.833 *i.e.*, by Re. 0.167 per unit and the profit declines from Rs. 5.834 per unit to Rs. 5.667 per unit, *i.e.*, Re. 0.167 per unit. It is advisable to work on existing machine.

Problem 7.21 A company reported its operating results for 1994 and 1995 as follows :

	1994	1995
	Rs.	*Rs.*
Sales	8,00,000	9,03,000
Less : Cost of Sales	6,40,000	6,70,000
Contribution	1,60,000	2,33,000
Fixed Cost	1,80,000	1,90,000
Profit/Loss	(–) 20,000	43,000

During 1995 selling prices were raised by 5%. Prepare a statement bringing out the factors leading to change in the profit earned in 1995 over 1994.

Solution :

	Rs.
Sales in 1995	= 9,03,000

(a) Increase in profit due to increase in price

$$= 9,03,000 \times \frac{5}{105}$$

$$= 43,000$$

(b) Increase in Profit due to increase in sales volume :

	Rs.
Sales for 1995	9,03,000
Less : Increase in Sales Price	43,000
Sales of 1995 at 1994 Prices	8,60,000
Less : Sales in 1994	8,00,000
Increase in sales volume	60,000

Increase in Profit due to increase in sales volume

$$= \frac{60,000}{8,00,000} \times (1,80,000 - 20,000)$$

$$= \text{Rs. } 12,000$$

(c) Increase in profit due to reduction in costs :

	Rs.
Cost of sales in 1994	= 6,40,000
Add : Increase in cost due to increase in sales	
$6,40,000 \times \frac{60,000}{8,00,000}$	= 48,000
	6,88,000
Less : Cost of sales in 1995	6,70,000
Increase in Profit	18,000

(d) Decrease in Profit due to increase in fixed cost :

	Rs.
Fixed cost in 1995	1,90,000
Less : Fixed cost in 1994	1,80,000
Decrease in Profit	10,000

STATEMENT OF FACTORS LEADING TO CHANGES IN PROFIT

		Rs.
Loss suffered in 1994		(–) 20,000
Add : Factors increasing profit in 1995 :		
(a) Increase in selling price	*Rs.* 43,000	

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(b) Increase in sales volume	12,000	
(c) Reduction in cost of sales	18,000	73,000
		53,000
Less : Factors decreasing Profit in 1995 :		
(a) Fixed cost		10,000
Profit earned in 1995		43,000

Problem 7.22 The following figures relate to two products A and B dealt by a firm :

	Product : A	*Product : B*
	Rs.	*Rs.*
Annual sales	25,00,000	25,00,000
Annual profits	3,50,000	3,50,000
Fixed Costs	9,00,000	2,50,000
Variable cost	12,50,000	19,00,000

Prepre a break-even chart for each product and find out the break-even point.

Solution :

Product A : *(Taking Costs and Sales as 100%)*

BREAK-EVEN CHART

% Capacity	*Fixed Cost* Rs.	*Variable Cost*(1) Rs.	*Total Cost* Rs.	*Sales*(2) Rs.
0	9,00,000	0	9,00,000	0
20	9,00,000	2,50,000	11,50,000	5,00,000
40	9,00,000	5,00,000	14,00,000	10,00,000
60	9,00,000	7,50,000	16,50,000	15,00,000
80	9,00,000	10,00,000	19,00,000	20,00,000
100	9,00,000	12,50,000	21,50,000	25,00,000

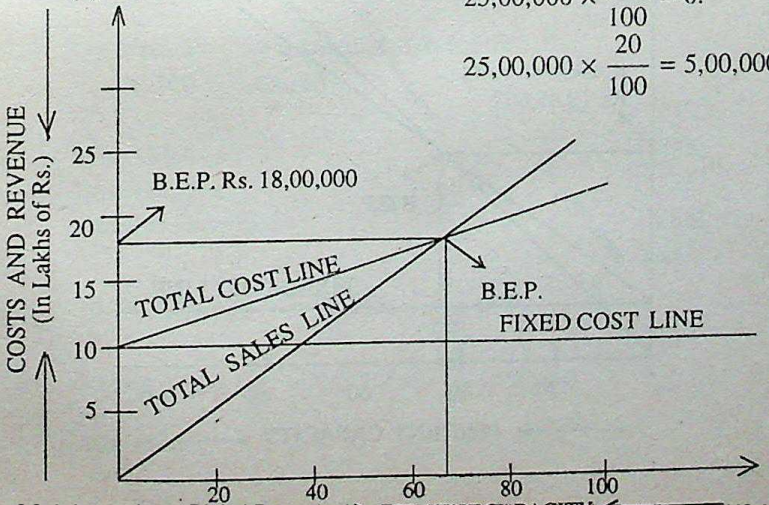
(1) Variable Cost is calculated as : $12,50,000 \times \frac{0}{100} = 0.$

$12,50,000 \times \frac{20}{100} = 2,50,000.$

$12,50,000 \times \frac{40}{100} = 5,00,000$ and so on.

(2) Sales are calculated as : $25,00,000 \times \frac{0}{100} = 0.$

$25,00,000 \times \frac{20}{100} = 5,00,000$ and so on.



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Algebric Verification :

$$\text{B.E.P.} = \frac{\text{Fixed Cost}}{\text{Contribution/Sales}}$$

$$= \frac{9,00,000}{\frac{12,50,000}{25,00,000}}$$

$$= \frac{9,00,000 \times 25,00,000}{12,50,000}$$

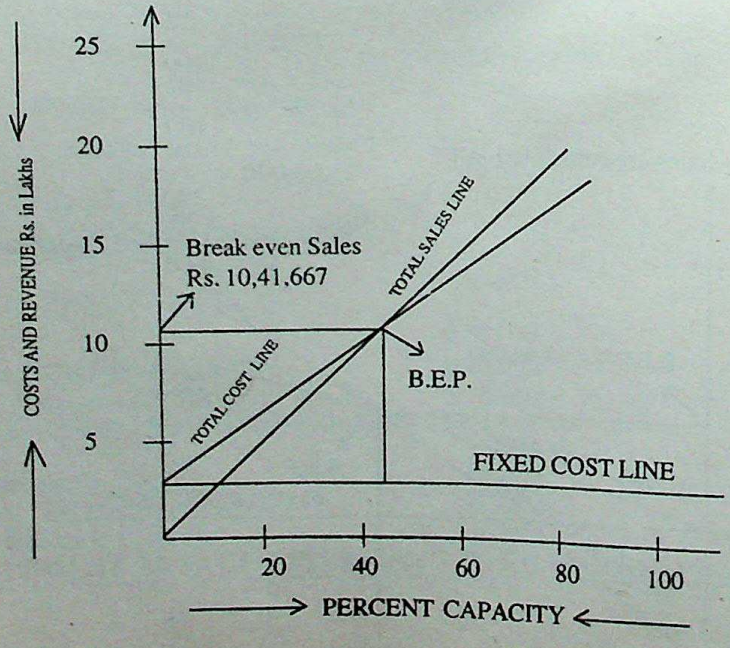
$$= \text{Rs. } 18,00,000$$

Product B (Taking Costs and Sales at 100%)

BREAK-EVEN CHART

% Capacity	*Fixed Costs* Rs.	*Variable Costs* Rs.	*Total Costs* Rs.	*Sales* Rs.
0	2,50,000	0	2,50,000	0
20	2,50,000	3,80,000	6,30,000	5,00,000
40	2,50,000	7,60,000	10,10,000	10,00,000
60	2,50,000	11,40,000	13,90,000	15,00,000
80	2,50,000	15,20,000	17,70,000	20,00,000
100	2,50,000	19,00,000	21,50,000	25,00,000

BREAK-EVEN GRAPH (PRODUCT B)



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Algebraic Verification :

$$\text{B.E.P.} = \frac{\text{Fixed Cost}}{\text{Contribution/Sales}}$$

$$= \frac{2,50,000 \times 25,00,000}{6,00,000}$$

Break–even Sales = Rs. 10,41,667.

Problem 7.23 The following figures relate to one year work in a manufactuting business :

	Rs.
Fixed overheads	12,000
Variable overheads	20,000
Direct wages	15,000
Direct materials	41,000
Sales	1,00,000

Represent each of the above figures on a break-even chart, and determine from the chart the break-even point.

Solution :

BREAK-EVEN CHART

% Capacity	*Fixed overheads Rs.*	*Variable Cost (1) Rs.*	*Total Cost Rs.*	*Sales Rs.*
0	12,000	—	12,000	—
20	12,000	15,200	27,200	20,000
40	12,000	30,400	42,400	40,000
60	12,000	45,600	57,600	60,000
80	12,000	60,800	72,800	80,000
100	12,000	76,000	88,000	1,00,000

(1) Variable Cost is calculated as follows :

At 100 % capacity :

	Rs.
Direct Material	41,000
Direct Wages	15,000
Variable Overheads	20,000
	76,000

At 0% Capacity $= 76,000 \times \frac{0}{100} = 0$

At 20% Capacity $= 76,000 \times \frac{20}{100} = 15,200$

and, so on....

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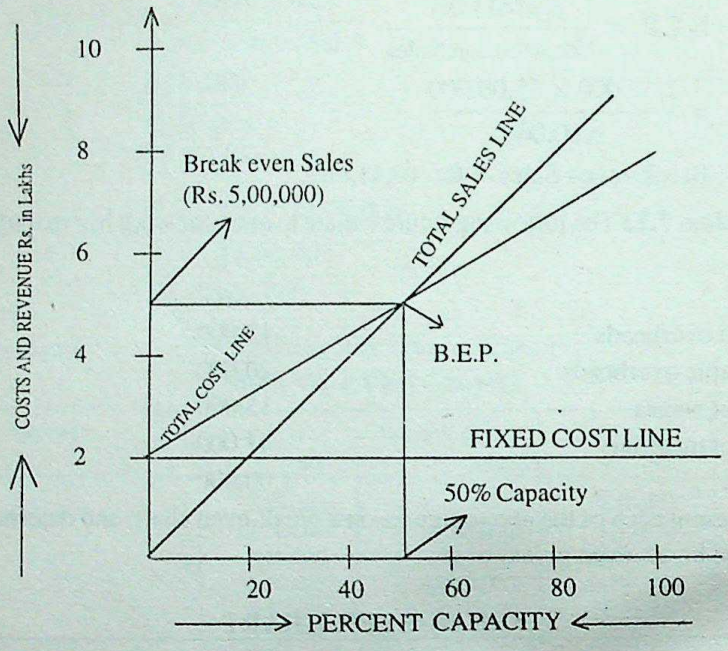
BREAK-EVEN GRAPH



Algebraic Verification :

$$\text{B.E.P.} = \frac{\text{Fixed Cost}}{\text{Contribution/Sales}}$$

$$= \frac{12,000}{24,000} \times 1,00,000$$

$$= \text{Rs. } 50,000.$$

Problem 7.24 *(a)* From the following particulars, draw a break-even chart and find out the break-even point :

	Rs.
Variable cost per unit	30
Fixed expenses	1,00,000
Selling price per unit	50

(b) What should be the selling price per unit, if the break-even point should be brought down to 4,000 units ?

(c) If the present value of sales is Rs. 4,00,000, what is the margin of safety on the basis of data given in *(a)* above.

Solution :

(a) **BREAK-EVEN CHART**

Units	*Fixed Cost Rs.*	*Variable Cost Rs.*	*Total Cost Rs.*	*Sales Rs.*
0	1,00,000	0	1,00,000	0
2,000	1,00,000	60,000	1,60,000	1,00,000
4,000	1,00,000	1,20,000	2,20,000	2,00,000
6,000	1,00,000	1,80,000	2,80,000	3,00,000
8,000	1,00,000	2,40,000	3,40,000	4,00,000

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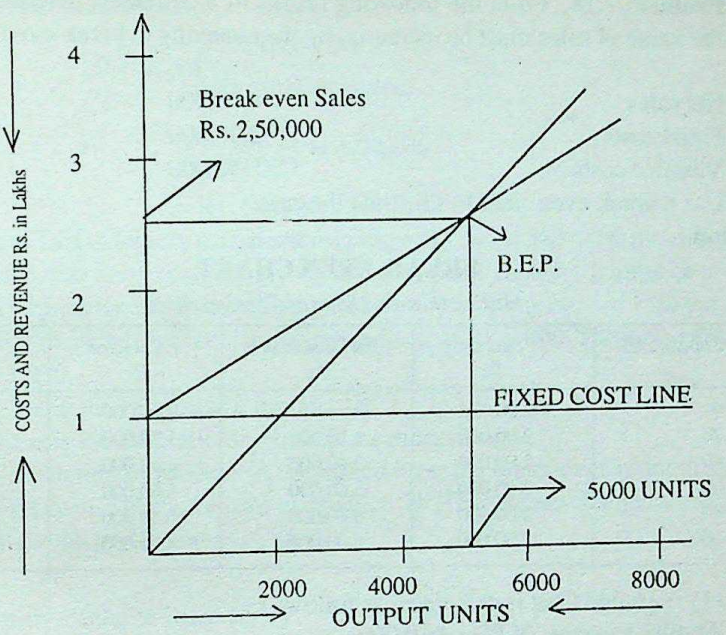
BREAK-EVEN GRAPH



Break-even Point = 5,000 unit

Algebraic Verification :

$$\text{B.E.P.} = \frac{\text{Fixed Cost}}{\text{Contribution (per unit)}}$$

$$= \frac{1,00,000}{50-30} = \frac{1,00,000}{20}$$

$$= 5,000 \text{ units.}$$

(b) If the break-even point is brought down to 4,000 units, the selling price will be calculated as follows :

$$\text{B.E.P.} = \frac{\text{Fixed Cost}}{\text{Contribution (per unit)}}$$

$$\text{or, Contribution per unit} = \frac{\text{Fixed cost}}{\text{B.E.P.}}$$

$$= \frac{1,00,000}{4,000}$$

$$= \text{Rs. } 25.$$

Selling Price per unit = Variable cost + Contribution.
= Rs. 30 + 25
= Rs. 55 per unit

(c) Margin of safety at sales of Rs. 4,00,000

Margin of safety = Present Sales-Sales at Break-even.
= Rs. 4,00,000 – 2,50,000
= Rs. 1,50,000.

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Problem 7.25. From the following results of a company, determine by how much the value of sales must be increased by the company to break-even.

	Rs.
Net sales	4,00,000
Fixed costs	2,00,000
Variable costs	2,40,000

Use a break-even chart to illustrate the case.

Solution :

BREAK-EVEN CHART

(Taking Costs and Sales at 40% Capacity)

% Capacity	*Fixed Cost Rs.*	*Variable Cost*[1] *Rs.*	*Total Cost Rs.*	*Sales Rs.*
0	2,00,000	—	2,00,000	—
20	2,00,000	1,20,000	3,20,000	2,00,000
40	2,00,000	2,40,000	4,40,000	4,00,000
60	2,00,000	3,60,000	5,60,000	6,00,000
80	2,00,000	4,80,000	6,80,000	8,00,000
100	2,00,000	6,00,000	8,00,000	10,00,000

(1) Variable Cost is calculated as follows :

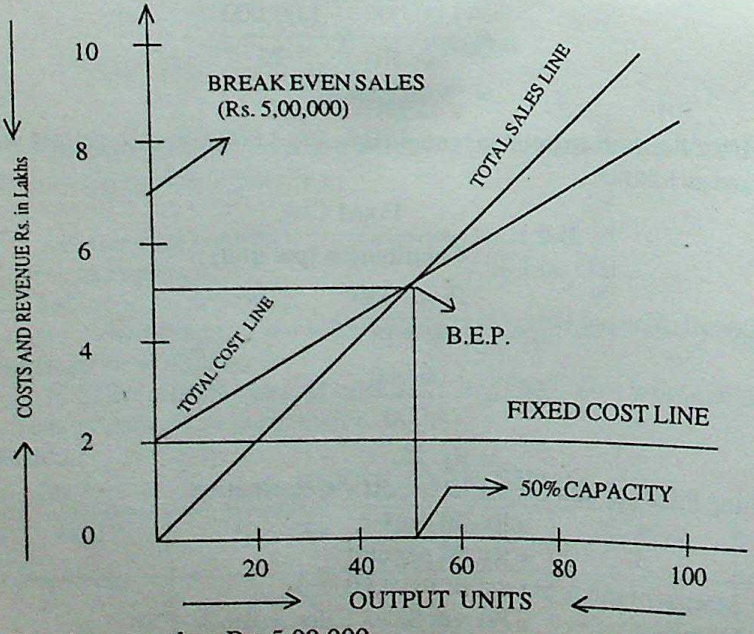
At 40% capacity, V.C. = 2,40,000

At 20% capacity, V.C. = 2,40,000 × 20/40 = Rs. 1,20,000

At 60% capacity, V.C. = 2,40,000 × 60/40 = Rs. 3,60,000

and, so on .....

BREAK-EVEN GRAPH



Break-even sale = Rs. 5,00,000

Present sales = Rs. 4,00,000.

Hence, sales must be increased by Rs. 1,00,000 to break-even.

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Algebraic Verification :

$$\text{B.E.P.} = \frac{\text{Fixed Cost}}{\text{Contribution/Sales}}$$

$$= \frac{2,00,000}{1,60,000} \times 4,00,000$$

$$= \text{Rs. } 5,00,000$$

Poblem 7.26 A factory manufactures two products 'A' and 'B' at the annual rate of 5,000 and 3,000 units respectively. In terms of plant capacity 2 units of product 'A' = 1 unit of product 'B'. Product 'A' gives a profit-volume ratio of 1.50 but a loss of Rs. 2,000 is incurred. Product 'B' has a fixed cost of Rs. 8,000. The net profit of the plant is Rs. 3,000.

(a) What is the P/V ratio of product 'B' ?

(b) What is the P/V ratio of whole plant in terms of 'A' ?

(c) If the output of product 'A' is pushed up to the break-even point to avoid a loss but at the expense of the volume of product 'B', find the net change in the profit.

(d) Draw the profit-volume Chart

Solution :

(a) Profit–Volume Ratio (P/V) $= \dfrac{\text{Contribution}}{\text{Sales}}$

$$= \frac{\text{Fixed Cost + Profit}}{\text{Sales}}$$

$$\text{P/V Ratio of Product 'B'} = \frac{8,000 + 5,000}{3,000 \text{ units}}$$

$$= \text{Rs. } 4.33 \text{ per unit.}$$

Profit of Product 'B' :

		Rs.
Loss of Product 'A'	=	(–) 2,000
Net Profit of the Plant	=	3,000
Profit of Product 'B'		5,000

As 'B' has wiped off the loss of Rs. 2,000 and given net profit of Rs. 3,000 of the entire plant ; hence profit of 'B' = (3,000 + 2,000) Rs. 5,000.

Output in terms of Product 'A' :

Product 'A'	= 5,000 units
Product 'B' = (3000×2)	= 6,000 units
Total	11,000 units

Total Fixed Cost :

Fixed Cost 'A' : P/V ratio = 1.5

Total Contribution of 'A' = 5000 × 1.5 = Rs. 7,500

Loss of 'A' = Rs. 2,000

So, Fixed Cost = Contribution + Loss

= 7,500 + 2,000

= Rs. 9,500.

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Fixed Cost of 'B' = Rs. 8,000 (given)

Total Fixed Cost = Rs. 9,500 + 8,000 = Rs. 17,500.

(b) P/V Ratio of the whole plant in terms of 'A'

$$= \frac{\text{Fixed Cost + Profit}}{\text{Sales}}$$

$$= \frac{17,500 + 3,000}{11,000 \text{ units}}$$

= Rs. 1.86 per unit.

(c) Break–even point of 'A' $= \frac{\text{Fixed Cost}}{\text{P/V ratio}}$

$$= \frac{9,500}{1.5}$$

= 6,333 units.

If output of Product 'A' is pushed upto B.E.P., *i.e.*, 6,333 units at expense of the output of Product 'B', the output of product 'B' will be 11,000–6,333 units, *i.e.* 4,667 units in terms of 'A' or 4,667 ÷ 2 in terms of 'B' 2,334 units.

New Contribution of 'B' at 2,334 units level = 2,334 × 4.33

= Rs. 10,106

Profit = Contribution–Fixed Cost

=10,106–8,000

= Rs. 2,106.

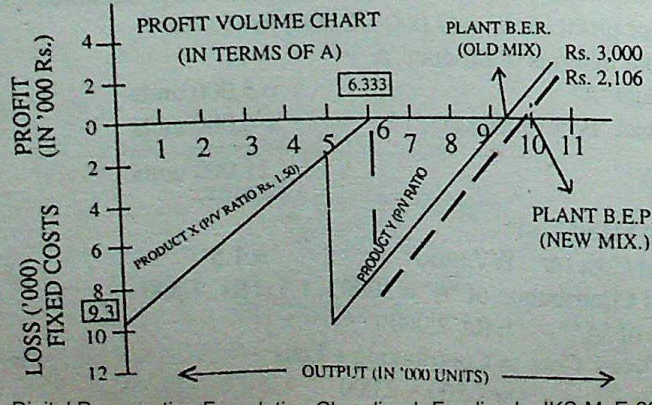
Hence, total profit shall be :– Rs. Nil (B.E.P. of 'A')

Plus Rs. 2,106 (of 'B')

Rs. 2,106

The total profit falls from Rs. 3,000 to Rs. 2,106 and hence change is not advisable.

PROFIT VOLUME CHART



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Problem 7.27 *(i)* Prepare a profit graph (break-even chart) using the following data :

Fixed costs	Rs. 1,20,000
Variable costs	Rs. 3 per unit
Selling price	Rs. 7 per unit
Output	50,000 units

(ii) Determine the profit for each the following situations :

(a) With the data above ;
(b) With a 10% decrease in output ;
(c) With a 10% increase in fixed costs ;
(d) With a 10% increase in variable costs ;
(e) With a 10% increase in selling price ;

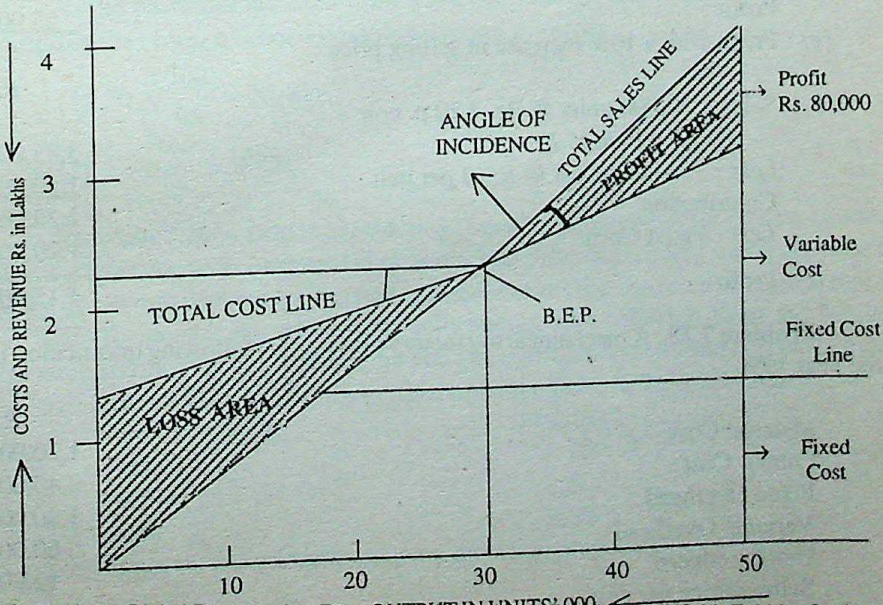
(iii) What is the significance of increase in output, fixed costs, variable costs and selling price to financial management ?

Solution :

BREAK-EVEN CHART

Output (units)	*Fixed Cost*	*Variable Cost @ Rs. 3 per unit*	*Total Cost*	*Sales @ Rs. 7 per unit*
	Rs.	*Rs.*	*Rs.*	*Rs.*
0	1,20,000	0	1,20,000	0
10,000	1,20,000	30,000	1,50,000	70,000
20,000	1,20,000	60,000	1,80,000	1,40,000
30,000	1,20,000	90,000	2,10,000	2,10,000
40,000	1,20,000	1,20,000	2,40,000	2,80,000
50,000	1,20,000	1,50,000	2,70,000	3,50,000

GRAPH



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		Rs.
(ii)	Profit with the given data :	
	Sales : 50,000 units @ Rs. 7 per unit	3,50,000
	Less : Variable Cost @ Rs. 3 per unit	1,50,000
	Contribution	2,00,000
	Less : Fixed Costs	1,20,000
	Profit	80,000
(b)	Profit with an increase of 10% in Output :	
	Sales (50,000 + 10% of 50,000) @ Rs. 7 per unit 55,000 units	3,85,000
	Less : Variable Cost @ Rs. 3 p. unit	1,65,000
	Contribution	2,20,000
	Less : Fixed Costs	1,20,000
	Profit	1,00,000
(c)	Profit with a 10% increase in fixed costs :	
		Rs.
	Sales : 50,000 units @ Rs. 7 p. unit	3,50,000
	Less : Variable Cost @ 3 p. unit	1,50,000
	Contribution	2,00,000
	Less : Fixed Cost (1,20,000 + 10% of 1,20,000)	1,32,000
	Profit	68,000
(d)	Profit with a 10% increase in Variable Cost :	
		Rs.
	Sales : 50,000 units @ Rs. 7 p. unit	3,50,000
	Less : Variable Cost @ Rs. 3.30 p. unit (3 + 10% of 3)	1,65,000
	Contribution	1,85,000
	Less : Fixed Costs	1,20,000
	Profit	65,000
(e)	Profit with a 10% increase in selling price :	
		Rs.
	Sales : 50,000 units @ Rs. 7.70 p. unit (7 +10% of 7)	3,85,000
	Less : Variable Cost @ Rs. 3 per unit	1,50,000
	Contribution	2,35,000
	Less : Fixed Costs	1,20,000
	Profit	1,15,000

Problem 7.28. A mechanical toy factory presents the following information for the year 1996 :

	Rs.
Material Cost	1,20,000
Labour Cost	2,40,000
Fixed Overhead	1,20,000
Variable Overhead	60,000
Units produced	12,000
Selling Price per unit	50

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The available capacity is a production of 20,000 units per year. The firm has an offer for the purchase of 5,000 additional units at a price of Rs. 40 per unit. It is expected that by accepting this offer there will be a saving of Re. 1 per unit in material cost on all units manufactured ; the fixed overhead will increase by Rs. 35,000 and the overall efficiency will drop by 2 per cent on all production. Draft a report to the management giving your recommendation as to whether this offer can be accepted.

Solution :

To decide the acceptance or otherwise of the additional order, the following comparative Profitability Statement is submitted :

COMPARATIVE PROFITABILITY STATEMENT

	Not Accepting the Order		*Accepting the Order*	
	Per unit Rs.	*Total* (12,000 units) Rs.	*Per unit* Rs.	*Total* (17,000 units) Rs.
Material	10	1,20,000	9.00	1,53,000
Labour	20	2,40,000	20.408(1)	3,46,936
Prime Cost	30	3,60,000	29.408	4,99,936
Variable Overhead	5	60,000	5.102(2)	86,734
(a) Marginal Cost	35	4,20,000	34.510	5,86,670
(b) Sales	50	6,00,000	50 for 12,000 40 for 5,000	8,00,000
(c) Contribution (a–b)		1,80,000		2,13,330
(d) Fixed Cost		1,20,000		1,55,000
(e) Profit (c–d)		60,000		58,330

As the profit has declined from Rs. 60,000 to Rs. 58,330 *i.e.* by Rs. 1,670 by accepting the order, it is not advisable to accept the order.

(1) $20 \times \frac{100}{98} = 20{,}408$

(2) $5 \times \frac{100}{98} = 5.102.$

Problem 7.29 A firm is considering two alternative prices for its new product which is expected to be marketed very soon. The sales department wants the price to be Rs. 20 per unit whereas the top management desires that the price be fixed at Rs. 22 per unit. To resolve the controversy information was collected from the Market Research and the Production Departments. The information collected is given below :

(i) Expected Sales Distribution per annum if price is Rs. 20 per unit :

Sales in units	Probability
5,000	.20
5,500	.50
6,000	.30

(ii) Expected Sales Distribution per annum if price is Rs. 22 per unit :

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Sales in units	Probability
4,500	.10
5,000	.40
5,500	.50

(iii) Estimated Costs for production upto 6,500 units :

Variable Costs per unit *Rs.*	Probability
10	.30
11	.70

Fixed Costs are likely to be around Rs. 35,000 per annum.

Which price the firm should choose ? Show all your calculations. Assume the decision has to be taken on the basis of the information supplied.

Solution :

Calculation of combined probability :

When price is Rs. 20	When price is Rs. 22
.20 × .30 = .06	.10 × .30 = .03
.20 × .70 = . 14	.10 × .70 = .07
. 50 × .30 = .15	.40 × .30 = .12
.50 × .70 = .35	.40 × 70 = .28
.30 × .30 = 09	.50 × .30 = .15
.30 × .70 = .21	.50 × .70 = .35
1.00	1.00

Calculation of contribution when selling price is Rs. 20 :

Selling Price	20.00	20.00
Less : Variable Cost	10.00	11.00
Contribution	10.00	9.00

Calculation of contribution when selling price is Rs. 22 :

	Rs.	*Rs.*
Selling Price	22.00	22.00
Less : Variable Cost	10.00	11.00
Contribution per unit	12.00	11.00

SATEMENT OF COMPARATIVE PROFITABILITY

When Selling Price is Rs. 20					*When Selling Price is Rs. 22*				
Sales units	*Contribution per unit*	*Total Contribution*	*Probability*	*Expected Contribution*	*Sales units*	*Contribution per unit*	*Total Contribution*	*Probability*	*Expected Contribution*
	Rs.	*Rs.*		*Rs.*		*Rs.*	*Rs.*		*Rs.*
5,000	10	50,000	.06	3,000	4,500	12	54,000	.03	1,620
5,000	9	45,000	.14	6,300	4,500	11	49,500	.07	3,465
5,500	10	55,000	.15	8,250	5,000	12	60,000	.12	7,200
5,500	9	49,500	.35	17,325	5,000	11	55,000	.28	15,400
6,000	10	60,000	.09	5,400	5,500	12	66,000	.15	9.900
6,000	9	54,000	.21	11,340	5,500	11	60,500	.35	21,175
		Total Contribution		51,615			Total Contribution		58,760
		Less : Fixed Cost		35,000			*Less :* Fixed Cost		35,000
		Profit		16,615			Profit		23,760

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The profit is Rs. 23,700 when selling price is Rs. 22 per unit and only Rs. 16,615 when selling price is Rs. 20 per unit. The firm should, therefore, adopt Rs. 22 per unit as the selling price.

Problem 7.30 The 'F' company has just been incorporated and plans to produce a product that will sell at Rs. 10 per unit. Preliminary market surveys shows that demand will be less than 10,000 units per year, but it is not clear by how much less.

The company has the choice of buying one of two machines, each of which has a capacity of 10,000 units per year. Machine A would have fixed costs of Rs. 30,000 per year and would yield a profit of Rs. 30,000 per year if sales were 10,000 units. Machine B has a fixed cost per year of Rs. 16,000 and would yield a profit of Rs. 24,000 per year with sales of 10,000 units.

Calculate :

(i) Break-even point for each machine.

(ii) The sales level where both machines are equally profitable.

(B. Com. Panjab)

Solution :

(i) Machine A :

		Rs.
Sales Value (10,000 units @ Rs. 10 per unit)		1,00,000
Less : Contribution, *i.e.* Fixed Cost + Profit (30,000 + 30,000)		60,000
Marginal Cost (10,000 units)		40,000
Marginal Cost per unit	$= \frac{40,000}{10,000} = \text{Rs. } 4$	
Contribution per unit	= Selling Price – Marginal Cost per unit = Rs. 10–4 = Rs. 6	
Break-even point	$= \frac{\text{Fixed Cost}}{\text{Contribution per unit}}$ $= \frac{30,000}{6}$ = 5,000 units.	

(i) Machine B :

Sales Value (10,000 units @ Rs. 10 per unit)	1,00,000
Less : Contribution, *i.e.* Fixed Cost + Profit (16,000 + 24,000)	40,000
Marginal Cost (10,000 units)	60,000

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Marginal cost per unit $= \frac{60,000}{10,000} = \text{Rs. } 6$

Contribution per unit = Rs. 10 – 6
= Rs. 4.

Break–even point $= \frac{\text{Fixed Cost}}{\text{Contribution per unit}}$

$= \frac{16,000}{4}$

= 4,000 units.

(ii) Sales level where both machines are equally profitable :
Contribution Ratio of machine A : Machine B
= 6 : 4
= 3 : 2

So, to give equal profit, both machines will have to produce 5,000 units and 4,000 units respectively to break-even and further units in the ratio of 2 : 3.

Say, for Machine A : 5,000 units + 2,000 units = 7,000 units
For Machine B : 4,000 units + 3,000 units = 7,000 units
At a sales level of 7,000 units both the machines will give equal profit as follows :

Machine A :	*Rs.*
Total contribution for 7,000 units @ Rs. 6 per unit	42,000
Less : Fixed cost	30,000
Profit	12,000

Machine B :	
Total contribution for 7,000 units @ Rs. 4 per unit	28,000
Less : Fixed cost	16,000
Profit	12,000

Problem 7.31 A social club is making plans for its annual dinner meeting. At first it was decided to restrict the attendance to members of the club only and to collect Rs. 8 per member attending the dinner meeting. At this rate, 30 members said they would attend. On this basis, the President of the club submitted the following budget of the meeting :

	Rs.
Estimated Receipts :	
30 members at Rs. 8	240
Estimated Disbursements :	
Entertainments	60
Chief guest's expenses	40
Diners-31 persons (Chief guest included) at Rs. 6	186
Estimated Deficit	46

When this budget was discussed in a meeting two proposal were made :
(1) Raising the charge to Rs. 10 per person and permit only club members to attend.

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(2) Leave the charge at Rs. 8 per person and permit members to bring guests (For guests also charge is Rs. 8 per head).

If the charge is as per proposal (2), it is expected 50 persons will attend.

Which of the two proposals is financially good ?

How many persons paying Rs. 8 must attend so that there will be no deficit or surplus ? *(B. Com. Kerala)*

COMPARATIVE PROFITABILITY STATEMENT

Proposal (1) @ Rs. 10 per head		*Proposal (2) @ Rs. 8 per head*	
	Rs.		*Rs.*
(a) Estimated Receipts (30 × 10)	300	*(a)* Estimated Receipts 50 × 8	400
(b) Marginal cost (Dinner : 30 × 6)	180	(b) Marginal cost (50 × 6)	300
(c) Contribution (a–b)	120	*(c)* Contribution (a–b)	100
(d) Fixed Expenses :		*(d)* Fixed Expenses :	
Entertainment Exp.	60	Entertainment	60
Chief guest Exp.	40	Chief guest Exp.	40
Dinner of Chief guest	6	Dinner of Chief guest	6
Total Fixed Expenses	106		106
(e) Profit (c–d)	14	*(e)* Loss (d – c)	6

(1) Proposal (1) gives a profit of Rs. 14 whereas there is a loss of Rs. 6 from Proposal (2), hence Proposal (1) is financially good.

(2) No deficit, no surplus or B.E.P.

$$\text{B.E.P.} = \frac{\text{Fixed Cost}}{\text{Contribution per unit}}$$

$$= \frac{106}{8-6}$$

$$= 53 \text{ persons.}$$

Problem 7.32. A firm has Rs. 10,00,000 invested in its plant and sets a goal of 15 percent annual return on investment.

Fixed costs in the factory presently amount to Rs. 4,00,000 per year and variable costs amount to Rs. 15 per unit produced. In the past year the firm produced and sold 50,000 units at Rs. 25 each and earned a profit of Rs. 1,00,000. How can management achieve their target profit goal by varying different variables like fixed costs, variable costs, quantity sold or increasing the price per unit. *(C.A. Final)*

Solution :

Desired Profit $= 10,00,000 \times \frac{15}{100} = \text{Rs. } 1,50,000$

Actual Profit (past year) = Rs. 1,00,000 (given)

Achieving desired profit by :

(i) Varying fixal costs :

Sales – Variable Cost = Fixed Cost + Profit

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or Fixed Cost = Sales – Variable Cost – Profit
= (50,000 × 25) – (50,000 × 15)
– 1,50,000
= Rs. 12,50,0000 – 7,50,000 – 1,50,000
= Rs. 3,50,000.

Hence, by reducing fixed cost from Rs. 4,00,000 to Rs. 3,50,000 the desired profit of Rs. 1,50,000 can be achieved.

(ii) Varying variable costs :

$$S - V = F + P$$
$$S - F - P + V$$

or Variable Cost = Rs. 12,50,000 – 4,00,000 – 1,50,000
= Rs. 7,00,000

or, $$\text{Variable Cost per unit} = \text{Rs.}\ \frac{7,00,000}{50,000} = \text{Rs. } 14$$

Hence, by reducing variable cost from Rs. 15 to Rs. 14 per unit, the desired profit of Rs. 1,50,000 can be achieved.

(iii) Varying quantity sold :

$$S - V = F + P$$

or $$S = F + P + V$$

or Quantity sold × Price = Fixed Cost + Profit + Quantity sold × Variable Cost per unit

or (Qty. × 25) = 4,00,000 + 1,50,000 + (Qty. × 15)

or 25 Qty. – 15 Qty. = Rs. 5, 50,000

or 10 Qty. = Rs. 5,50,000

$$\text{Qty.} = \frac{5,50,000}{10} = 55,000 \text{ units}$$

Hence, the desired profit can also be achieved by increasing the units of quantity sold to 55,000.

(iv) Varying selling Price per unit :

$$S - V = F + P$$
$$(\text{Qty.} \times \text{Price}) - (\text{Qty.} \times \text{V.C. per unit}) = \text{Fixed Cost} + \text{Profit}$$
$$(50,000 \times P) = (40,000 + 1,50,000) + (50,000 \times 15)$$
$$50,000\ P = \text{Rs. } 13,00,000$$

or $$\text{Price} = \frac{13,00,000}{50,000}$$
$$= \text{Rs. } 26$$

Hence, if the price is increased from Rs. 25 per unit to Rs. 26 per unit, the desired profit shall be achieved.

Problem 7.33 Any change in fixed costs, variable costs or selling price has the effect of shifting the break-even point although the impact of each change on the break-even point and profit is different. Illustrate this with the help of the figures given below assuming a 10% increase individually in each of the three elements stated above. Also

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show how the profit figure is affected if all the elements increase collectively, each by 10%.

		Rs.
Salers (30,000 units)		1,20,000
	Rs.	
Variable Cost	40,000	
Fixed Cost	50,000	90,000
		30,000

Solution :

(i) Increase in Fixed Cost by 10% :

	Rs.
Present Fixed Cost	= 50,000
Add 10% Increase	= 5, 000
Increased Fixed Cost	55,000

$$\text{Break–even Point} = \frac{\text{Fixed Cost}}{\text{Contribution/Sales}}$$

$$= \frac{55,000}{(1,20,000 - 40,000)} \times 1,20,000$$

$$= \frac{55,000 \times 1,20,000}{80,000}$$

$$= \text{Rs. } 82,500$$

$$\text{Present B.E.P.} = \frac{50,000}{(1,20,000 - 40,000)} \times 1,20,000$$

$$= \frac{50,000 \times 1,20,000}{80,000}$$

$$= \text{Rs. } 75,000$$

Hence, the B.E.P. has increased from sales of Rs. 75,000 to Rs. 82,500.

(ii) Increase in Variable Cost :

	Rs.
Present Variable Cost	= 40,000
Add : 10% increase	= 4,000
Increased Variable Cost	44,000

$$\text{Break–even point} = \frac{50,000}{(1,20,000 - 44,000)} \times 1,20,000$$

$$= \frac{50,000}{76,000} \times 1,20,000$$

$$= 78,947,37.$$

The break-even point has increased from Rs. 75,000 to Rs. 78,947.37.

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(iii) Increase in selling price by 10% :

$$\text{Present Selling Price} = \frac{1,20,000}{30,000} = \text{Rs. } 4.00$$

Add : 10% Increase =	0.40
Increased Selling Price	4.40

Increased Sales = Rs. 30,000 × 4.40
= Rs. 1,32,000

$$\text{B.E.P.} = \frac{50,000}{(1,32,000 - 40,000)} \times 1,32,000$$

$$= \frac{50,000}{92,000} \times 1,32,000$$

= Rs. 71,739

The Break-even point comes down from Rs. 75,000 to Rs. 71,739.

(iv) Collective increase of 10%

	Rs.	*Rs.*
Sales		1,32,000
Variable Cost	44,000	
Fixed Cost	55,000	99,000
Profit		33,000

Profit has increased from Rs. 30,000 to Rs. 33,000.

$$\text{B.E.P.} = \frac{55,000}{(1,32,000 - 44,000)} \times 1,32,000$$

= Rs. 82,500

The B.E.P. has increased from Rs. 75,000 to Rs. 82,500.

Problem 7.34. From the following data you are required to calculate break-even point and sales value at this point :

	Rs.
Direct Material Cost per unit	8
Direct Labour Cost per unit	5
Fixed Overheads	24,000
Variable Overheads @ 60% on direct labour	
Selling Price per unit	25
Trade Discount	4%

If sales are 15% and 20% above the break-even volume, determine the net profits.

Solution :

STATEMENT OF COST AND PROFIT

		Rs.
(a)	Selling Price per unit	25
(b)	Trade Discount @ 4%	1
(c)	Net Sales per unit (a–b)	24
(d)	Marginal Cost :	
	Direct Material	8

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Direct Labour	5
Variable Overheads (60% of 5)	3
	16

(e) Contribution (c – d) 8

$$\text{Break-even Point} = \frac{\text{Fixed Cost}}{\text{Contribution per unit}}$$

$$= \frac{24,000}{8}$$

= 3,000 units.

Net Sales Value at B.E.P. :	*Rs.*
Sales of 3,000 units @ Rs. 25 each	75,000
Less : Trade Discount @ 4%	3,000
Net Sales Value	72,000

Profit when Sales are 15% above B.E.P.

Additional sales $= 3,000 \times \frac{15}{100} = 450$ units

Profit = Rs. 450 × 8 (Contribution per unit)

= Rs. 3,600

Profit when Sales are 20% above B.E.P.

Additional Sales $= 3,000 \times \frac{20}{100} = 600$ units

Profit = 600 × 8 (Contribution per unit)

= Rs. 4,800

Problem 7.35. There are two plants manufacturing the same product under one corporate management which decides to merge them.

Following particulars are available regarding the two plants :

	Plant I	Plant II
Capacity operation	100%	60%
Sales	Rs. 300 Lakhs	Rs. 120 Lakhs
Variable costs	Rs. 220 Lakhs	Rs. 90 Lakhs
Fixed Costs	Rs. 40 Lakhs	Rs. 25 Lakhs.

You are required to calculate for the consideration of the Board of Directors :

(a) What would be the capacity of the merged plant for the purpose of break-even ?

(b) What would be the profitability on working at 80% of the merged capacity.

(c) What would be the sales required to give an overall profit of Rs. 65 Lakhs.

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Solution :

(a) STATEMENT OF PROFITABILITY AT 100% CAPACITY

	Plant I (Rs. Lakhs)	*Plant II* (Rs. Lakhs)	*Total* (Rs. Lakhs)
Sales	300	$200 \left(120 \times \frac{100}{60}\right)$	500
Less : Variable Cost	220	$150 \left(90 \times \frac{100}{60}\right)$	350
Contribution	80	50	130
Fixed Costs	40	25	65
P/V Ratio $\left(\frac{\text{Contribution}}{\text{Sales}} \times 100\right)$	$\frac{80}{300} \times 100$	$\frac{50}{200} \times 100$	$\frac{130}{500} \times 100$
Or P/V Ratio	= 26.7%	25%	26%

Break–even sales $= \frac{\text{Fixed Cost}}{\text{P/V Ratio}}$

Break–even sales (for merged plant) $= \frac{65}{26\%}$

$= 65 \times \frac{100}{26}$

= Rs. 350 Lakhs

Break–even point (as a% age of capacity) $= \frac{250}{500} \times 100$

$= 50\%$

(b) PROFITABILITY OF WORKING AT 80% OF MERGED CAPACITY

Sales at 80% capacity $= 500 \times \frac{100}{80}$ = Rs. 400 lakhs.

Contribution $= 130 \times \frac{80}{100}$ = Rs. 104 lakhs

Fixed costs = Rs. 65 lakhs (given)

∴ Profit = Rs. 104 – 65 lakhs

=Rs. 39 lakhs

(c) SALES REQUIRED TO GIVE AN OVERALL PROFIT OF RS. 65 LAKHS

Desired Sales $= \frac{\text{Fixed Cost + Profit}}{\text{P/V Ratio}}$

$= \frac{65 + 65}{26\%}$

$= \frac{130 \times 100}{26}$

= Rs. 500 Lakhs.

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8

Differential Cost Analysis

Problem 8.1. From the following information, you are required to determine the most profitable level of output :

	Output 0–15,000 units	*15,001 to 25,000 units*	*25,001 to 30,000 units*
	Rs.	*Rs.*	*Rs.*
Sales Price per unit	16.00	15.20	15.20
Variable cost per unit	12.00	12.00	12.20
Fixed cost	60,000	64,000	78,000

Solution :

STATEMENT SHOWING INCREMENTAL REVENUE AND DIFFERENTIAL COST

Output in Units	*Selling Price per unit Rs.*	*Sales Value Rs.*	*Incremental Revenue Rs.*	*Variable Cost Rs.*	*Fixed Cost Rs.*	*Total Cost Rs.*	*Differential Cost Rs.*
15,000	16.00	2,40,000	—	1,80,000	60,000	2,40,000	—
25,000	15.20	3,80,000	1,40,000	3,00,000	64,000	3,64,000	1,24,000
30,000	15.20	4,56,000	76,000	3,66,000	78,000	4,44,000	80,000

The most profitable level of output is 25,000 units because upto this level the incremental revenue is more than differential cost.

Problem 8.2. Volumes of output of a product to be manufactured and sold may be 1,000, 2,000 or 3,000. When the above units of the product are sold, the selling prices per unit are estimated to be Rs. 50, Rs. 45 and Rs. 40 respectively. Costs of direct materials and direct labour are respectively Rs. 12 and Rs. 10 per unit. Variable manufacturing over heads costs are 75% of the direct wages. The variable administrative, selling and distribution costs are respectively Rs. 6 per unit. Fixed costs are the same for all volumes.

Apply the differential cost analysis to determine the most profitable volume to manufacture and sell. *(M. Com., Bombay)*

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Solution :

STATEMENT OF INCREMENTAL REVENUE AND DIFFERENTIAL COST

Output units	Selling Price	Sales Value	Incremental Revenue Rs.	Direct Material cost @ Rs. 12	Direct Labour @ Rs. 10	Variable Manufacturing overhead @ Rs. 7.50	Variable Selling Exp. @ Rs. 6.00	Total Variable cost	Differential Cost
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
1,000	50	50,000	—	12,000	10,000	7,500	6,000	35,500	—
2,000	45	90,000	40,000	24,000	20,000	15,000	12,000	71,000	35,500
3,000	40	1,20,000	30,000	36,000	30,000	22,500	18,000	1,06,500	35,500

The most profitable volume to manufacture and sell is 2,000 units because upto this level of output incremental revenue exceeds differential cost. At 3,000 level of output the revenue increases by Rs. 30,000 while the cost increases by Rs. 35,500 whereby it will reduce profit by Rs. 5,500.

Problem 8.3 Modern Sewing Machine Co. manufactures hand operated sewing machines in batches of 60,000. Prepare a schedule showing the total differential cost and increments in revenue from the following data. At what volume the company should set its level of production ?

Output (No. in Lakhs	*Selling price per machine Rs.*	*Total semi-fixed cost (Rs. in lakhs)*	*Total Variable cost (Rs. in lakhs)*	*Total fixed cost (Rs. in lakhs)*
0.60	240	30	8.36	28.4
1.20	220	30	1,636	28.4
1.80	200	34	2,556	28.4
2.40	180	34	3,156	28.4
3.00	160	40	3,556	28.4
3.60	140	40	3,804	28.4

(I.C.W.A., Final)

Solution :

STATEMENT OF INCREMENTAL REVENUE AND DIFFERENTIAL COST

Output No. in lakhs	*Selling price per machine Rs.*	*Sales value (Rs. in lacs)*	*Incremental Revenue*	*Semi-fixed Cost (Rs. in lacs)*	*Var. Cost*	*Fixed Cost*	*Total Cost*	*Differntial Cost*
0.60	240	144	—	30	83.6	28.4	142	—
1.20	220	264	120	30	163.6	28.4	222	80
1.80	200	360	96	34	255.6	28.4	318	96
2.40	180	432	72	34	315.6	28.4	378	60
3.00	160	480	48	40	355.6	28.4	424	46
3.60	140	504	24	40	380.6	28.4	449	25

The company should set its level of output at 3 lakh units because upto this level incremental revenue exceeds differential cost. At 3.60 lakh units the differential cost of 25 lakhs is more than the incremental revenue of Rs. 24 lakhs.

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Problem 8.4. The XYZ company manufactures a product which costs :

Fixed (per month) Rs. 1,000
Variable (per unit) 10 paise

Sales are at present 10,000 units per month at 30 paise per unit.

(a) A proposal to extend the sales to a foreign market has come where demand for an additional 5,000 units per month is expected. However, to do this it will be necessary to absorb additional shipping costs and duties amounting to 12 paise per unit. Will the foreign business be profitable ?

(b) A domestic chain store has offered to take 5,000 units per month at 18 paise per unit. Should this order be accepted in place of the foreign order ?

(c) The sales department proposes to reduce the selling price of the product to increase sales. The following estimates of the sales volume at various prices are made :

30 paise per unit (the present price) 10,000 units per month.
25 paise per unit 14,000 units per month.
20 paise per unit 19,000 units per month.

Assuming that the above estimates are correct, should you reduce the price ? If so, to what level ? *(C.A. Final)*

Solution :

(a) Differential Cost of additional 5,000 units :

Variable cost @ 10 paise per unit (5,000 @ 10 paise)	= Rs. 500
Additional shipping cost & duties @ 12 paise per unit	= Rs. 600
	1,100

Incremental Revenue of 5,000 units :

5,000 units @ 30 paise per unit	= Rs. 1,500
Incremental Gain	= Rs. 1,500–1,100
	= Rs. 400

The foreign business will be profitable since it gives incremental gain of Rs. 400.

(b) Supply to Domestic Chain Store :

Differential Cost of 5,000 units @ 10 paise per unit	= Rs. 500
Incremental Revenue : 5,000 units @ 18 paise per unit	= Rs. 900
Incremental Gain	= Rs. 900–500
	= Rs. 400

On the basis of incremental gain, to sell the additional 5000 units to a foreign customer or a domestic chain store is equally profitable as incremental gain is Rs. 400 in both the cases. But we should prefer to sell in the foreign market because otherwise the price differential may affect our domestic sales at 30 paise per unit.

(b) **Reduction of Price**

	Rs.
(i) At 10,000 units	
Sales @ 30 paise per unit	= 3,000
Less : Variable Cost @ 10 paise	= 1,000

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Contribution	2,000
Less : Fixed Cost	1,000
Net Profit	1,000

(ii) *At 14,000 units*

Sales @ 25 paise per unit	= 3,500
Less : Variable Cost @ 10 paise	= 1,400
Contribution	2,100
Less : Fixed Cost	1,000
Net Profit	= 1,100

(iii) *At 19,000 units :*

	Rs.
Sales @ 20 paise per unit	3,800
Less : Variable Cost @ 10 paise	1,900
Contribution	1,900
Less : Fixed Cost	1,000
Net Profit	900

As the profit of Rs. 1,100 is maximum at a level of 14,000 units per month, the price should be reduced to 25 Paise per unit.

Problem 8.5. A company is at present working at 90 percent of its capacity and producing 13,500 units per annum. It operates a flexible budgetary control system. The following figures are obtained from its budget :

	90%	*100%*
	Rs.	*Rs.*
Sales	15,00,000	16,00,000
Fixed Expenses	3,00,500	3,00,600
Semi-fixed Expenses	97,500	1,00,500
Variable Expenses	1,45,000	1,49,500
Units made	13,500	15,000

Labour and material cost per unit are constant under present conditions. Profit margin is 10 per cent.

(a) You are required to determine the differential cost of producing 1,500 units by increasing capacity to 100%.

(b) What would you recommend for an export price for these 1,500 units taking into account that overseas prices are much lower than indigenous prices ?

(I.C.W.A., Final)

Solution :

		Rs.
Sales at 90% Capacity		15,00,000
Less : Profit @ 10%		1,50,000
Cost of Sales		13,50,000
Less : Overheads :	*Rs.*	
Fixed	3,00,500	
Semi-fixed	97,500	
Variable	1,45,000	5,43,000
Cost of Material and Labour at 90% Capacity		8,07,000

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Cost of Material and Labour at 100% of Capacity

$$= \text{Rs. } 8,07,000 \times \frac{100}{90}$$

$$= \text{Rs. } 8,99,667$$

DIFFERENTIAL COST ANALYSIS

	90% Capacity	*100% Capacity*	*Differential Cost*
Production Units	13,500	15,000	
	Rs.	*Rs.*	*Rs.*
Material and Labour	8,07,000	8,96,667	89,667
Variable Expenses	1,45,000	1,49,500	4,500
Semi-fixed expenses	97,500	1,00,500	3,000
Fixed Expenses	3,00,500	3,00,600	100
Total Cost	13,50,000	14,47,267	
Differential Cost			97,267

Minimum Price for export $= \frac{97,267}{1,500}$

= Rs. 64.84 per unit

At the price of Rs. 64.84 per unit, there is no addition to revenue ; so any price above Rs. 64.84 per unit may be acceptable as the export price.

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9

Standard Costing and Variance Analysis

Problem 9.1. The standard material requird for production is 10,500 kgs. A price of Rs. 2 kg. has been fixed for the materials. The actual quantity of materials used for the product is 11,000 kg. A sum of Rs. 24,750 has been paid for the materials.

Calculate :

(i) Material Cost Variance
(ii) Material Rate Variance
(iii) Material Usage Variance

Solution :

(i) *Material Cost Variance*

Standard Material Cost – Actual Material Cost
Standard Material Cost = Standard Quantity × Standard Rate
= 10,500 kg. × Rs. 2
= Rs. 21,000
Material Cost Variance = Rs. 21,000 – Rs. 24,750
= Rs. 3,750 Unfavourable

(ii) *Material Rate Variance*

Actual Quantity (Standard Rate–Actual Rate)

$$\text{Actual Rate} = \frac{\text{Rs. } 24,750}{11,000 \text{ kg}} = \text{Rs. } 2.25$$

Material Rate Variance = 11,000 (Rs. 2.00 – Rs. 2.25)
= Rs. 2,750 Unfavourable

(iii) *Material Usage Variance*

Standard Rate (Standard Quantity – Actual Quantity)
Rs. 2 (10,500kg – 11,000 kg.)
Material Usage Variance = Rs. 2(–500)
= Rs. 1,000 Unfavourable

Verification :

Material Cost Variance = Material Rate Variance + Material Usage Variance
Rs. 3,750 Unfavourable = Rs. 2,750 (Unf.) + Rs. 1,000 (Unf.)
Rs. 3,750 (unf.) = Rs. 3,750 (unf.)

Problem 9.2. A product is manufactured by using three types of materials. A, B and C. The cost price per unit of these materials are Rs. 5 Rs. 8 and Rs. 10 respectively. During a month 600 units of product A, 500 units of product B, and 850 units of product C were produced. These materials were purchasd at a price of Rs. 6 for product A, Rs. 7.50 for product B and Rs. 9 per unit for product C.

Calculate Material Price Variance.

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Solution :

Material Price Variance

Actual Quantity (Standard Material Price – Actual Material Price)

Product A : 600 (Rs. 5 – Rs. 6) = Rs. 600 Unfavourable

Product B : 500 (Rs. 8 – Rs. 7.50)= Rs. 250 Favourable

Product C : 850 (Rs. 10 – Rs. 9) = Rs. 850 Favourable

Total Material Price Variance = Rs. 500 Favourable

Problem 9.3. Following information has ben taken from the records of a manufacturing concern. Calculate material variances.

	Standard			*Actual*		
	Qty. kgs	*Unit Price Rs.*	*Total Rs.*	*Qty. Kgs.*	*Unit Price Rs.*	*Total Rs.*
Material A	4	1.00	4.00	2	3.50	7.00
Material B	2	2.00	4.00	1	2.00	2.00
Material C	2	4.00	8.00	3	3.00	9.00
			16.00			18.00

Solution :

Material Cost Variance

Materials Cost Variance = Standard Material Cost – Actual Material Cost

Standard Material Cost = $4 \times 1 + 2 \times 2 + 2 \times 4$ = Rs. 16

Actual Material Cost = $2 \times 3.50 + 1 \times 2 + 3 \times 3$ = Rs. 18

Materials Cost Variance = 16 – 18 = Rs. 2 Adverse.

Materials Price Variance

Materials Price Variance = Actual Usage (Standard Price-Actual Price)

Material A = 2 kgs. (Re. 1 – Rs. 3.50) = Rs. 5 Adverse

Material B = 1 kg (Rs. 2 – Rs. 2) = Nil

Material C = 3 kgs. (Rs. 4 – Rs. 3) = Rs. 3 Favourable

Total Material Price Variance

= – Rs. 5 + Nil + Rs. 3

= Rs. 2 Adverse.

Materials Usage Variance

Materials Usage Variance = Standard Price (Standard usage – Actual usage)

Material A = Re. 1 (4 kgs – 2 kgs)
= Rs. 2 Favourable.

Material B = Rs. 2 (2 kgs – 1kg)
= Rs. 2 Favourable

Material C = Rs. 4 (2 kgs – 3 kgs)
= Rs. 4 Adverse.

Materials Mix Variance

Materials Mix Variance

$$\left(\frac{\text{Total weight of Actual Mix}}{\text{Total weight of Standard Mix}}\right) \times \left(\frac{\text{Standard Cost of}}{\text{Standard Mix}}\right) - \text{Standard Cost of Actual Mix}$$

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$$= \frac{2 \text{ kgs} + 1 \text{ kg} + 3 \text{ kgs}}{4 \text{ kgs} + 2 \text{ kgs} + 2 \text{ kgs}} \quad (4 \times \text{Re. } 1 + 2 \times \text{Rs. } 2 + 2 \times \text{Rs. } 4)$$

$$- \quad (2 \times \text{Re. } 1 + 1 \times \text{Rs. } 2 + 3 \times \text{Rs. } 4)$$

$$= \left(\frac{6}{8} \times \text{Rs. } 16\right) - \text{Rs. } 16 = \text{Rs. } 12 - \text{Rs. } 16 = \text{Rs. } 4 \text{ Adverse.}$$

Problem 9.4. The following information find out :

(i) Material Cost Variance

(ii) Material Price Variance

(iii) Material Usage Variance

Quantity of material purchased	3,000 units
Value of materials purhcased	Rs. 9,000
Standard quantity of material required per tonne of finished product	25 units
Standard rate of materials	Rs. 2 per unit
Opening stock of materials	Nil
Closing stock of materials	500 units
Finished production during the year	80 tonnes

Solution :

Actual usage = Opening Stock + Purchases – Closing Stock

= Nil + 3,000 units – 500 units

= 2,500 units.

Standard quantity of material required per tonne of finished product is 25 units.

Standard quantity of material required for an actual output of 80 tonnes is 2,000 (80 × 25) units.

$$\text{Acutal price of material per unit} = \frac{\text{Value of material purchased}}{\text{Quantity of material purchased}}$$

$$= \frac{\text{Rs. } 9{,}000}{3{,}000} = \text{Rs. } 3$$

(a) Material Price Variance

Actual Usage (Standard Rate – Actual Rate)

2,500 units (Rs. 2 – Rs. 3) = Rs. 2,500 Adverse.

(b) Material Usage Variance

Standard Rate (Standard Usage – Actual Usage)

Rs. 2 (2,000 units – 2,500 units)

= Rs. 1,000 Adverse

(c) Material Cost Variance

Standard Cost of material – Acutal Cost of material

Standard usage × Standard Rate – Actual Usage × Actual Rate

2,000 units × Rs. 2 – 2, 500 units × Rs. 3

= Rs. 3,500 Adverse.

Problem 9.5. A factory is engaged in producing a product using two grades of materials A and B mixed in the ratio of 3 : 2. The standard price of material A is Rs. 4 per unit and that of B Rs. 3 per unit. Normal loss in production is expected at 10%. Due to shortage of materials it was not possible to use the standad mix. However, normal loss is still expected to be 10% as earlier.

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The actual result was as follows :

Material A	280 tons at Rs. 3.80
Material B	120 tons at Rs. 3.60

Actual production 364 tons.

Calculate Material Price Variance, Material Mix Variance, Material Yield Variance and Material Cost Variance.

Solution :

(a) Material Price Variance

Actual Quantity (Standard Price – Actual Price)

Material A : 280 (Rs. 4.00 – Rs. 3.80) = Rs. 56 favourable
Material B : 120 (Rs. 3.00 – Rs. 3.60) = Rs. 72 Adverse
Total Material Price Variance = Rs. 56 – Rs. 72
= Rs. 16 Adverse

(b) Material Mix Variance

Standard Price (Revised Std. Qty. – Actual Qty.)

Material A: Rs. 4 (240 – 280) = Rs. 160 Adverse
Material B : Rs. 3 (160 – 120) = Rs. 120 Favourable
Total MAterial Mix Variance = – Rs. 160 + Rs. 120
= Rs. 40 Adverse

(c) Material Yield Variance

Standard Rate[2] (Std. Yield – Actual yield)

Rs. 4 (360 – 364) = Rs. 16 Favourable

(d) Material Cost Variance

Standard Material Cost – Actual Material Cost

Rs. 1,456 – Rs. 1,496 = Rs. 40 Adverse

Note :

1. Calculation of revised standard quantity

Material A $= \frac{3}{5} \times 400 = 240$ tons

Material B $= \frac{2}{5} \times 400 = 160$ tons

2. Standard Rate

$$= \frac{\text{Standard Cost of Standard Mix}}{\text{Standard Yield from Standard Mix}}$$

$$= \text{Rs. } \frac{1,440}{360} = \text{Rs. } 4 \text{ per unit}$$

Standard Cost of Standard Mix
= 204 × 4 + 160 × 3 = Rs. 1440

Standard Yield = Material A : 240 tons
Material B : 160 tons
400 tons
Less : Normal Loss (10%) 40 tons
Standard yield = 360 tons

3. Standard Cost = Actual Output × Standard Rate per unit
= 364 × Rs. 4 = Rs. 1,456

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Actual Cost = Material A : 280 tons × Rs. 3.80 = Rs. 1,064
Material B : 120 tons × Rs. 3.60 = Rs. 432
Total Actual Cost = Rs. 1,496

Problem 9.6. The standard cost of a chemical mixture is :
40% Material A at Rs. 20 per kg.
60% Material B at Rs. 30 per kg.
A standard loss of 10% is expected in production. During a period, there is used :
90 kgs Material A at a cost of Rs. 18 per kg.
110 kgs Material B at a cost of Rs. 34 per kg.
The weight producd is 182 kgs of good product. Calculate
(a) Material price variance
(b) Material mix variance
(c) Material yield variance
(d) Material cost variance

Solution :

There is a standard loss of 10% in production, so standard output will be 90% of standard input. Standard output for 182 kg (actual) will be :

$$182 \times \frac{100}{90} = 202 \text{ kgs}$$

Standard input of material A
= 40% of 202 = 80.8 kg.
Standard input of material B
= 60% of 202 = 121.1 k.g.

(a) *Material Price Variance*
Actual Quantity (Standard Price – Actual Price)
Material A : 90 (20 – 18) = Rs. 180 Favourable
Material B : 110 (30 – 34) = Rs. 440 Adverse
Total Price Variance = Rs. 260 Adverse

(b) *Material Mix Variance*
Standard Price (Standard Mix – Acutal Mix)
Standard Mix
Material A = 40% of 200 = 80
Material B = 60% of 200 = 120
Material Mix Variance
A : 20 (80 – 90) = Rs. 200 Adverse
B : 30 (120 – 110)= Rs. 300 Favourable
Total Material Mix Variance
= Rs. 100 Favourable

(c) *Material Yield Variance*
Standard Price (Actual Yield – Standard Yield)
Standard Yield = 90% of 300 = 180 kgs

$$\text{Standard Price} = \frac{(80 \times 20 + 120 \times 30)}{200} = \text{Rs. } 26$$

Yield Variance = 26 (180 – 182) = Rs. 52 Favourable

(d) *Material Cost Variance*
Standard Material Cost – Actual Material Cost

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Material A : (80.8 ×20) – (90 × 18)
= 1,616 – 1,620 = Rs. 4 Adverse
Material B : 121.2 × 30 – 110 ×34
= 3,636 – 3,740 = Rs. 104 Adverse
Total Material Cost Variance
= Rs. 108 Adverse

Problem 9.7. A furniture manfuacturer uses Sunmica tops for tables. From the following information, find out price Variance, Usage Variance and Joint Variance :

Standard quantity of Sunmica per table	4 sq. metre
Standard price per sq. metre of Sunmica	Rs. 500
Actual production of tables	1,000
Sunmica actually used	4,300 sq. metre

Actual purchase price of Sunmica per sq. metre Rs. 5.50. Who is responsible for the above variances.

Solution :

Material Price Variance
Actual quantity (Standard Price – Actual Price)
4,300 (Rs. 5 – Rs. 5.50)
Rs. 2,150 Unfavourable

Purchase Manager is responsible for this variance. If unfavourable variance is due to change in prices then it will be controllable.

Usage Variance
Standard Price (Standard Usage – Actual Usage)
Rs. 5 (1,000 ×4 – 4,300)
= Rs. 1,500 Unfavourable

If variance is due to poor quantity of materials then Purchase Manager will be responsible ; if it is due to excessive wastage to materials then foreman will be responsible.

Joint Variance
Standard Cost or Materials – Actual Cost of Marterials
1,000 × 4 × Rs. 5 – 4,300 × Rs. 5.50
= Rs. 3,650 Unfavourable

Verification
Joint Variance or Material Cost Variance
= Material Price Variance + Usage Variance
– Rs. 3,650 = – Rs. 2,150 + (–Rs. 1,500)
– Rs. 3,650 = – Rs. 3,650

Problem 9.8. From the following information, compute *(a)* Mix *(b)* Price and *(c)* Usage Variance :

	Standard			*Actual*		
	Qty	Unit Price	Total	Qty	Unit Price	Total
Material A	10	2.00	20.00	5	3.00	15.00
Material B	20	3.00	60.00	10	6.00	60.00
Material C	20	6.00	120.00	15	5.00	75.00
	50	4.00	200.00	30	5.00	150.00

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Solution :

(a) Material Mix Variance

$$\left(\frac{\text{Total Weight of Actual Mix}}{\text{Total Weight of Standard Mix}} \times \text{Standard Cost of Actual Mix}\right) - (\text{Standard Cost of Actual Mix})$$

$$\left(\frac{30}{50} \times 10 \times 2 + 20 \times 3 + 20 \times 6\right) - (5 \times 2 + 10 \times 3 + 15 \times 16)$$

$$\left(\frac{3}{5} \times 200\right) - (130) = \text{Rs. 10 Unfavourable}$$

(b) Material Price Variance

Actual Quantity (Standard Price – Actual Price)

Material A : 5 kgs. (Rs. 2 – Rs. 3)	= Rs. 5 unfavourable
Material B : 10 kgs. (Rs. 3 – Rs. 6)	= Rs. 30 unfavourable
Material C : 15 kgs. (Rs. 6 – Rs. 5)	= Rs. 15 Favourable
Total Material Price Variance	= Rs. 20 Unfavourable

(c) Material Usage Variance

Standard Price (Standard Qty. – Actual Qty.)

Material A : Rs. 2 (10 kgs. – 5 kg)	= Rs. 10 Favourable
Material B : Rs. 3 (20 kgs. – 10 kg)	= Rs. 30 Favourable
Material C : Rs. 6 (20 kgs. – 15 kg)	= Rs. 30 Favourable
Total Material Usage Variance	= Rs. 70 Favourable

Problem 9.9 XY Ltd. Manufacturers of product P use a standard cost system. Standard product and cost specifications for 1,000 kg. of product are as follows :–

Ingredients	Quantity kgs	Price per kg	Cost Rs.
A	800	2.50	2,000
B	200	4.00	800
C	200	1.00	200
Input	1,200		Rs. 3,000
Output	1,000		Rs. 2.50 per kg.
			Rs. 3.00 per kg.

Material records indicate :

	Consumption in January
A	1,57,000 kgs : at Rs. 2.40
B	38,000 kgs : at Rs. 4.20
C	36,000 kgs : at Rs. 1.10

Actual finished production for the month of January is 2,00,000 Kgs. Calculate :

1. Material Price Variance
2. Material Mix Variance
3. Material Yield Variance

[I.C.W.A. Inter]

Solution :

$$\text{Standard Total Input} = \frac{2,00,000 \times 1,200}{1,000} = 2,40,000 \text{ kgs.}$$

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1. *Material Price Variance*
   Actual Quantity (Standard Price – Actual Price)
   Material A : 1,57,000 (2.50 – 2.40) = Rs. 15,700 Fav.
   Material B : 38,000 (4.00 – 4.20) = Rs. 7,600 Adv.
   Material C : 36,000 (1.00 – 1.10) = Rs. 3,600 Adv.
   Total Material Price Variance = Rs. 4,500 Favourable
2. *Material Mix Variance*
   Standard Price (Standard Mix – Actual Mix)

$$\text{Standard Mix} = \frac{\text{Standard Qty. of Material} \times \text{Total Actual Qty.}}{\text{Total Standard Qty.}}$$

$$\text{Material A} = \frac{800 \times 2,31,000}{1,200} = 1,54,000 \text{ kgs.}$$

$$\text{Material B} = \frac{200}{1,200} \times 2,31,000 = 38,500 \text{ kgs.}$$

$$\text{Material C} = \frac{200}{1,200} \times 2,31,000 = 38,500 \text{ kgs.}$$

   Material Mix Variance
   Material A : 2.50 (1,54,000 – 1,57,000) = Rs. 7,500 Adv.
   Material B : 4.00 (38,500 – 38,000) = Rs. 2,000 Fav.
   Material C : 1.00 (38,500 – 36,000) =Rs. 2,500 Fav.
   Total Material Mix = Rs. 3,000 Adverse.
3. *Material Yield Variance*
   Standard Price (Actual yield – Standard yield for actual usage)
   Standard yield for actual usage

$$= \frac{\text{Total Material used}}{\text{Total Standard Material}} \times \text{Actual yield}$$

$$= \frac{2,31,000}{2,40,000} \times 2,00,000 = 1,92,500$$

   Yield Variance = 3.00 (2,00,000 – 192,500)
   = Rs. 22,500 Favourable

Problem 9.10. Vinayak Ltd. produces an article by blending two basic raw materials. It operates a standard costing system and the following standards have been set for raw materials :

Material	*Standard Mix*	*Standard Price per kg.*
A	40%	Rs. 4.00
B	60%	Rs. 3.00

The standard loss in processing is 15%.
During April, 1996 the company produced 1,700 kgs. of finsihed output.
The position of stocks and purchases for the month of April 1996 is as under :–

Material	*Stock on 1-4-96 kgs.*	*Stock on 30-4-96 kgs*	*Purchased during April 1996*	
			kgs.	*Cost Rs.*
A	35	5	800	3,400
B	40	50	1,200	3,000

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Calculate the following variances :

(i) Material Price Variance.
(ii) Material Usage Variance
(iii) Material Yield Variance
(iv) Material Mix Variance
(v) Total Material Cost Variance *[C. A. Inter]*

Solution :

Calculation of Standard Cost of Standard Mix

Material	*Std. Qty of material required*	*Std. Price per kg*	*Standard Cost*
	kg	*Rs.*	*Rs.*
A	800	4	3,200
B	1,200	3	3,600
Total	2,000		6,800

The standard loss is 15% ; so to get 85 finished kgs. 100 kgs. of material are required. Actual finished product is 1,700 kgs. ; so standard material required will be

$\left(\frac{1,700 \times 100}{85}\right)$ 2000 kgs.

Out of 2,000 kgs. material A will be 800 kgs (40%) and materiai B will be 1,200 kgs (60%)

Calculation of Actual Cost of Material used

Material A :

Opening Stock : 35 kgs. @ Rs. 4 (standard rate)	Rs. 140
Out of Purchases : 795 kgs. @ Rs. 4.25. (actual rate)	Rs. 3,378.75
(Purchases - closing stock)	Rs. 3,518.75

Material B :

Opening Stock : 40 kgs. @ Rs. 3 (standard rate)	Rs. 120
Out of Purchases : 1,150 kgs. @ 2.50 (actual rate)	Rs. 2,875
	Rs. 2995

(Purchases – closing stock)

Actual Rate :

$$\text{Material A} = \frac{\text{Rs. } 3,400}{800 \text{ kgs.}} = \text{Rs. } 4.25$$

$$\text{Material B} = \frac{\text{Rs. } 3,000}{1,200 \text{ kgs.}} = \text{Rs. } 2.50$$

(i) Material Price Variance

Material A : (830 kgs. × 4) – (35 kgs. × 4 + 795 kgs. × 4.25)
= Rs. 3,320 – Rs. 3,51,8.75
= Rs. 198.75 Adverse

Material B = (1,190 kgs × 3) – (40 kgs. × 3+1, 150 kgs. × 2.50)
= Rs. 3.570 – Rs. 2,995 = Rs. 575 Favourable)

Total Material Price Variance
= – 198.75 + 575 = Rs. 376.25 Favourable)

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(ii) Material Usage Variance

Standard Price (Standard Usage – Actual Usage)

Material A : Rs. 4 (800 kgs. – 830 kgs.) = Rs. 120 Adverse.

Material B : Rs. 3 (1,200 kgs. – 1,190 kgs.) = Rs. 30 Favourable

Total Material Usage Variance = – 120 + 30 = Rs. 90 Adverse

(iii) Material Yield Variance

Standard Rate (Actual Yield – Standard Yield)

Rs. 4 (1,700 kgs. – 1,717 kgs.)

= Rs. 68 Adverse

$$\text{Standard Rate} = \frac{\text{Rs. } 6,800}{1,700 \text{ kgs.}} = \text{Rs. } 4$$

$$\text{Standard Yield} = \frac{1,700}{2,000} \times 2,020 = 1,717 \text{ kgs.}$$

(iv) Material Mix Variance

$$\left(\frac{\text{Total Weight of Actual Mix}}{\text{Total Weight of Standard Mix}} \times \text{Standard Cost of Standard Mix} \right)$$

– (Standard Cost of Actual Mix)

$$\left(\frac{2,020}{2,000} \times \text{Rs. } 6,800 \right) - (830 \text{ kgs.} \times 4 + 1, 190 \text{ kgs.} \times 3$$

Rs. 6,868 – Rs. 6,890 = Rs. 22 Adverse

(v) Total Material Cost Variance

Standard Cost of Materials – Actual Cost of Materials

Rs. 6,800 – Rs. 6.513.75 = Rs. 286.25 Favourable

Problem 10.11. The standard material cost to prepare a tonne of chemical Y is :

200 kg. of material A @ Rs. 10 per kg.

300 kg. of material B @ Rs. 5 per kg

400 kg. of material C @ Rs. 7 per kg.

During the period, 100 tonnes of mixture Y were producd from the usage of :

30 tonnes of material A at a cost of Rs. 9.00 per tonne

40 tonnes of material B at a cost of Rs. 6.00 per tonne

50 tonnes of material C at a cost of Rs. 7.00 per tonne

Calculate :

(a) Material Cost Variance.

(b) Material Price Variance.

(c) Material Usage Variance.

Solution :

Sandard cost for 100 tonnes of mixture Y :

	Qty. Kg.	Rate Rs.	Amount Rs.
A	20,000	10	2,00,000
B	30,000	5	1,50,000
C	40,000	7	2,80,000
	90,000		6,30,000

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Actual Material Cost

	Qty. *kg.*	*Rate* *Rs.*	*Amount* *Rs.*
A	30,000	9	2,70,000
B	40,000	6	2,40,000
C	50,000	7	3,50,000
	1,20,000		8,60,000

(a) *Material Cost Variance*

Standard Material Cost – Actual Material Cost

Rs. 6,30,000 – Rs. 8,60,000

= Rs. 2,30,000 Adverse

(b) *Material Price Variance*

Actual Quantity (Standard Price – Actual Price)

Material A : 30,000 (10 – 9) = Rs. 30,000 Favourable

Material B : 40,000 (5 – 6) = Rs. 40,000 Adverse

Material C : 50,000 (7 – 7) = Nil

Total Price Variance = Rs. 10,000 Adverse

(c) *Material Usage Variance*

Standard Price (Standard Quantity – Actual Quantity)

Material A : 10 (20,000 – 30,000) = Rs. 1,00,000 Adverse

Material B : 5 (30,000 – 40,000) = Rs. 50,000 Adverse

Material C : 7 (40,000 – 50,000) = Rs. 70,000 Adverse

Total Material Usage Varance = Rs. 2,20,000 Adverse

Verification

Material Cost Variance = Material Price Variance + Material Usages Variance.

Rs. 2,30,000 Adverse = Rs. 10,000 Adverse + Rs. 2,20,000 Adverse

Rs. 2,30,000 Adverse = Rs. 2,30,000 Adverse.

Problem 9.12. Find out Labour Mix Variance from the data given as under :

Budgeted Labour composition for producing 500 articles

100 men @ Rs. 1.50 per hour for 20 hours

200 Women @ Rs. 1.25 per hour for 15 hours

Actual Labour composition for producing 500 articles

120 Men @ Rs. 1.75 per hour for 15 hours

200 Women @ 1.25 per hour for 20 hours.

Solution :

Labour Mix Variance :

Since there is a difference between standard time and actual time, variance will be calculated as :

$$\left(\frac{\text{Actual Labour Mix}}{\text{Standard Labour Mix}} \times \text{Standard Cost of Standard labour mix}\right)$$

– (Standard Cost of Actual Labour Mix)

Standard Cost of Standard Mix :

	Rs.
Men : 100 × 20 × 1.50	3,000
Women : 200 × 15 ×1.25	3,750
	6,750

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Standard Cost of Actual Mix :

	Rs.
Men : 120 × 15 × 1.50	2,700
Women : 200 × 20 × 1.25	5,030
	7,700

$$\text{Labour Mix Variance} = \left(\frac{5,800}{5,000} \times 6,750\right) - \text{Rs. } 7,700$$

= Rs. 7,830 – Rs. 7,700

= Rs. 130 Favourable

Problem 9.13. In a factory 100 workers are engaged and the average rate of wage is 50 paise per hour. Standard working hours per week are 40 and the standard performance is 10 units per gang hour.

During a week in March, wages paid for 50 workers were at the rate of 50 paise per hour, 10 workers at 70 paise per hour and 40 workers at 40 paise per hour. Actual output was 380 units.

The factory did not work for five hours due to breakdown of machinery. Calculate appropriate labour variancs.

Solution :

(a) Labour Cost Variance

= Standard Labour Cost – Actual Labour Cost

$$\text{Standard Labour Rate} = \frac{100 \times 0.50}{10} = \text{Rs. } 5 \text{ per unit}$$

Actual Labour Cost = 50 workers for 40 hours @ 50 P. per hour = Rs. 1,000

10 Workers for 4 hours @ 70 P. per hour = Rs. 280

40 Workers for 40 hours @ 40 P. per hour = Rs. 640

Actual Labour Cost = Rs. 1,920

Labour Cost Variance = 380 units × Rs. 5 – Rs. 1,920

Rs. 1,900 – Rs, 1,920 = Rs. 20 Unfavourable

(b) Labour Rate Variance

Actual Hours (Actual Rate – Standard Rate)

400 (79 P. – 50 P.) = Rs. 80 Unfavourable

1600 (40 P. – 50P.) = Rs. 160 Favourable

Labour Rate Variance = Rs. 80 Favourable

(c) Labour Efficiency Variance

Standard Rate (Actual Hours – Standard Hours)

50 P. (3,500 – 3,800) = Rs. 150 Favourable

Actual Hours = (100 × 40) – (100 × 5)

4,000 – 500 (Idle time) = 3,500

$$\text{Standard Hours} = \frac{380}{10} \times 100 = 3,800$$

(d) Idle Time Variance

Idle Hours × Standard Rate

500 Hours ×50 P. = Rs. 250 Unfavourable.

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(e) Yield Variance

Standard Rat (Actual Yield – Standard Yield)

Rs. 5 (380 – 350) = Rs. 150 Favourable

$$\text{Standard Yield} = \frac{4{,}000 - 500}{10}$$

$$= \frac{3{,}500}{10} = 350$$

Problem 9.14. Calculate labour variances from the following information :

Standard Time	Standard Wages
3,900 Hours	Rs. 7,800
Actual Time Taken	Actual Wages Paid
4,025 Hours	Rs. 8,055.

Solution :

Labour Cost Variance

Standard Labour Cost – Actual Labour Cost

Rs. 7,800 – Rs. 8,050 = Rs. 250 Adverse.

Labour Rate Variance

Actual Time (Standard Rate – Actual Rate)

$$\text{Standard Rate} = \frac{\text{Rs. } 7{,}800}{3{,}900 \text{ Hrs.}} = \text{Rs. } 2$$

$$\text{Actual Rate} = \frac{\text{Rs. } 8{,}050}{4{,}025 \text{ Hrs.}} = \text{Rs. } 2.$$

Labour Rate Variance = 4,025 (Rs. 2 – Rs. 2)

= Nil

Labour Efficiency Variance

Standard Rate (Standard Hours – Actual Hours)

Rs. 2 (3,900 – 4,025) = Rs. 250 Adverse.

Problem 9.15. The standard and actual labour force required for completing a job taking one week period is given as follows :

	Standard		*Actual*	
	No. of workers	*Weekly Rate*	*No. of workers*	*Weekly Rate*
				Rs.
Skilled workers	45	50	48	55
Semi-skilled workers	50	40	45	40

Calculate :

(i) Labour Cost Variance

(ii) Labour Rate Variance

(iii) Labour Efficiency Variance

Solution :

(i) Labour Cost Variance

Standard Labour Cost – Actual Labour Cost

Skilled Workers : (45 × 50) – (48 × 55)

Rs. 2,250 – Rs. 2,640 = 390 Adverse

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Semi-skilled workers : (50× 40) – (45 × 40)
Rs. 2,000 – Rs. 1,800
= 200 Favourable
Total Labour Cost Variance = 190 Adverse

(ii) Labour Rate Variance
Actual Time (Standard Rate – Actual Rate)
Note : In this case, actual time is actual number of workers.
Skilled workers = 48 (50 – 55)
= Rs. 240 Adverse
Semi-skilled workers 45 (40 – 40)
= Nil
Total Labour Rate variance = 240 Adverse

(iii) Labour Efficiency Variance
Standard Rate (Standard Time – Actual Time)
Skilled workers : 50 (45 – 48)
= Rs. 150 Adverse
Semi-skilled workers : 40 (50 – 45)
= Rs. 200 Favourable
Total Labour Efficiency Variance = Rs. 50 Favourable

Verification : Labour Cost variance = Labour Rate Variance + Labour Efficiency Variance

– 190 = –240 + 50
= –Rs. 190 = – Rs. 190

Problem 9.16. From the following data, calculate material and labour variances :
1 tonne of material input yields a standard output of 1 lakh units. Number of employers is 200.
The standard wage rate per employee per day is Rs. 6
Standard price of material is Rs. 20 per kg.
Actual quantity of material issued by production department is 10 tonnes
Actual price of material is Rs. 21 per kg.
Actual output is 9 lakh units
Actual wage rate per day is Rs. 6.50
Standard daily output per employee is 100 units
Total number of days worked is 50
Idle time paid for and included above is $\frac{1}{2}$ day.

Solution:

(i) Material Cost Variance
Standard Cost of Matrials – Actual Cost of Materials
(9,000 kg × Rs. 20) – (10,000 kg × Rs. 21)
Rs. 1,80,000 – Rs. 2,10,000 = Rs. 30,000 Unfavourable
Standard quantity for 1,00,000 units is 1 tonne or 1,000 kilos ;
so standard quantity for 9,00,000 units is 9,000 kilos.

(ii) Material Price Variance
Actual Quantity (Standard Price – Actual Price)
10,000 kg. (Rs. 20 – Rs. 21)
= Rs. 10,000 Unfavourable

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(iii) Material Usage Variance

Standard Cost (Standard Quantity – Actual Quantity)

Rs. 20 (9,000 kg – 10,000 kg)

= Rs. 20,000 Unfavourable

(iv) Labour Cost Variance

Standard Cost of Labour – Actual Cost of Labour

9,000 mandays × Rs. 6 –10,000 mandays × Rs. 6.50

= Rs. 54,000 – Rs. 65,000

= Rs. 11,000 Unfavourable

Standard Time : Standard time for 100 units is 1 manday, so standard time for actual output of 9,00,000 units is 9,000 mandays.

Actual Time = 50 × 200 =10,000 mandays.

(v) Labour Rate Variance

Actual Time (Standard Rate – Actual Rate)

10,000 mandays (Rs. 6 – Rs. 6.50)

= Rs. 5,000 Unfavourable

(vi) Labour Efficiency Variance

Standard Rate (Standard Time – Actual Time)

Rs. 6 (9,000 mandays – 9,900 mandays)

= Rs. 5,400 Unfavourable

(vii) Idle Time Variance

Idle Time × Standard Rate

100 mandays ×Rs. 6 = Rs. 600 Unfavourable

Idle time for 1/2 day for 200 workers is 100 man days.

Problem 9.17. Calculate the variances from the following information according to originating cause :

Standard direct cost per unit :		*Rs.*
Material Cost	= 5 kg	50
Labour Cost	= 20 hours	10
		60

For the production of 500 units material consumption amounted to Rs. 25,650 against 2.7 M.T. Wage payment was Rs. 6,050 for 11,000 hours including 20 hours idle time due to machine breakdwon. *(M. Com. Bombay)*

Solution :

Material Cost Variance

Standard Cost of Material – Actual Cost of Material

Standard Cost of Material = 500 × 50 = Rs. 25,000

Material Cost Variance = Rs. 25,000 – Rs. 25,650

= Rs. 650 Unfavourable

Material Price Variance

Actual Quantity (Standard Rate – Actual Rate)

2,700 kg. (Rs. 10 – Rs. 9.50)

= Rs. 1,350 Favourable

$$\text{Actual Rate} = \frac{25,650}{2,700} = \text{Rs. } 9.50$$

(2.7 M. T. is equal to 2,700 kg.)

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Material Usage Variance

Standard Rate (Standard Quantity – Actual Quantity)

Rs. 10 (2,500 kg – 2,700 kg.) = Rs. 2,000 Unfavourable

Standard Quantity = 500 × 5 = 2 500 kg.

Labour Cost Variance

Standard Labour Cost – Actual Labour Cost

Standard Labour Cost = 500 units ×Rs. 10 = Rs. 5,000

Labour Cost Variance = Rs. 5,000 – Rs. 6,050

= Rs. 1,050 Unfavourable

Rate of Pay Variance

Actual Time (Standard Rate – Actual Rate)

11,000 Hours (Re. 0.50 – 0.55)

= Rs. 550 Unfavourable

$$\text{Actual Rate} = \frac{\text{Rs. } 6,050}{11,000 \text{ units}}$$

= 0.55 P.

Labour Efficiency Variance

Standard Rate (Standard Time – Actual Time)

Re. 0.50 (10,000 Hours – 10,980 Hours)

= Rs. 490 Unfavourable

Actual Time = 11,000 Hours – 20 Hours (Idle time)

= 10,980 Hours

Idle Time Variance

Idle time Standard Rate

20 Hours × Rs. 0.50=Rs. 10 Unfavourable

Problem 9.18. The standard cost card for a product shows as this :

	Per unit Rs.
Material cost-2 kg. @ Rs. 2.50 each	5.00
Wages-2 hours @ 50 P. each	1.00

The actuals which have emerged from business operations are as follows :

Production	8,000 units
Materials Consumed :	Rs.
16,500 kg. @ Rs. 2.40 each	39,600
Wages paid :	
18,000 hours @ 40 P. each	7,200

Calculate appropriate material and labour variances. *(B. Com,. Hons. Delhi)*

Solution :

Material Cost Variance

Standard cost of material – Actual cost of material

(8,000 units ×2 kg. × Rs. 2.50) – (16.500 kg. × 2.40)

= Rs. 400 Favourable

Material Price Variance

Acual Quantity (Standard Price – Actual Price)

16,500 (Rs. 2.50 – Rs. 2.40)

= Rs. 1,650 Favourable

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Material Usage Variance

Standard Price (Standard Quantity – Actual Quantity)

Rs. 2.50 (16,000 – 16,500) = Rs. 1,250 Unfavourable

Labour Cost Variance

Standard Cost of Labour – Actual Cost of Labour

(8,000 units × 2 Hrs. × 0.50) – (18,000 Hrs. ×Re. 0.40)

= Rs. 800 Favourable

Labour Rate Variance

Actual Hours (Standard Rate – Actual Rate)

18,000 Hours (0.50 P. – 0.40 P)

= Rs. 1,800 Favourable

Labour Efficiency Variance

Standard Rate (Standard Hours – Actual Hours)

Re. 0.50 (16,000 – 18,000) = Rs. 1,000 Unfavourable

Problem 9.19. The standard cost card reveals the following information :

Labour rate : 0.50 p. per hour

Hours set per unit for production : 10 hours.

Actual data are given below :

Units produced	:	500
Hours worked	:	6,000
Actual labour cost	:	2,400

Calculate Labour Variances.

Solution :

Standard Time = 10 Hours × 500 units = 5,.000 Hours

Standard Cost = Standard Rate × Standard Time

= 0.50 P × 5,000 Hours = Rs. 2,500

Labour Cost Variance

Standard Labour Cost – Actual Labour Cost

Rs, 2,500 – Rs. 2,400 = Rs. 100 Favourable

Labour Rate Variance

Actual Time (Standard Rate – Actual Rate)

$$\text{Actual Rate} = \frac{\text{Actual Cost}}{\text{Actual Hours Worked}}$$

$$= \frac{\text{Rs. } 2,400}{6,000} = \text{Rs. 40 paise per hour}$$

Labour Rate Variance = 6,000 Hrs. (0.50 – 0.40 P)

= Rs. 600 Favourable

Labour Efficiency Variance

Standard Rate (Standard Time – Actual Time)

0.50 P (5,000 Hours – 6,000 Hours)= Rs. 500 Unfavourable

Verification

Labour Cost Variance = Labour Rate Variance + Labour Efficiency Variance

Rs. 100 Fav. = Rs. 600 Fav. + Rs. 500 Unfav.

Rs. 100 Fav. = Rs. 100 Fav.

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Problem 9.20. From the following data calculate overhead variance :

	Budgeted	Actual
No. of working days	20	21
Manhours in period	40,000	43,000
Output per manhour in units	3.2	3
Total output in units	1,28,000	1,29,000
Overheads :		
Variable	Rs. 1,02,400	Rs. 1,14,400
Fixed	Rs. 25,600	Rs. 25,000

Solution :

Fixed Overhead Variance

Actual output × Standard Fixed Overhead Rate – Actual Fixed Overhead

$$\text{Standard Rate} = \frac{\text{Standard Fixed Overhead}}{\text{Standard output in units}}$$

$$= \frac{\text{Rs. 25,600}}{\text{1,28,000 units}}$$

$$= \text{Rs. 0.20}$$

Fixed Overhead Variance = 1,29,000 × 0.20 – Rs. 25,000
= Rs. 25,800 – Rs. 25,000
= Rs. 800 Favourable

Variable Overhead Variance

$$\text{Standard Variable Rate} = \frac{\text{Rs. 1,02,400}}{\text{1,28,000 units}}$$

$$= \text{Re. 0.80}$$

Variable Overhead Variance = 1,29,000 × 0.80 – Rs. 1,14,400
= Rs. 1,03,200 – Rs. 1,14,400
= Rs. 11,200 Unfavourable

Expenditure Variance

Budgeted Fixed Overheads – Actual Fixed Overheads
Rs. 25,600 – Rs. 25,000 = Rs. 600 Favourable

Volume Variance

Actual output × Standard Rate – Budget Fixed Overheads
1,29,000 × 0.20 – Rs. 25,600
= Rs. 25,800 – Rs. 25,600
= Rs. 200 Favourable

Capacity Variance

Standard Rate (Revised Budgeted units – Budgeted units)
Revised Budgeted units = 43,000 × 3.2 = 1,37,600 units
Capacity Variance = Re. 0.20 (1,37,600 – 1,28,0000)
= Re. 0.20 (9,600)
= Rs. 1,920 Favourable

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Calender Variance

Standard Rate × Change in units due to one day

$$\text{Units in one day} = \frac{1,37,600}{20} = 6,880$$

Calender Variance = 0.20 × 6,880
= Rs. 1,376 Favourable

Efficiency Variance

Standard Rate (Actual Production – Standard Production)

Standard Production :

Budgeted Production	= 1,28,000
Increase in units due to change in capacity	9,600
Increase in unit due to change in one day	6,880
Standard Production	= 1,44,480

Efficiency Variance = 0.20 (1,29,000 – 1,44,480)
= Rs. 3,096 Unfavourable

Verification

Volume Variance = Capacity Variance + Calender Variance + Efficiency Variance

Rs. 200 Fav. = Rs. 1,920 + Rs. 1,376 – R. 3,096

Rs. 200 Fav. = Rs. 200 Favourable

Problem 9.21. The following data are available with respect to particular department for weekly operations :

Standard Output for 40 hours week	2,000 units
Standard fixed overheads	Rs. 2,000
Actual output	1,800 units
Actual hours worked	32
Actual fixed overheads	2,250

Compute overhead variances.

Solution :

(a) Overheads Cost Volume

Standard Overhead for Actual Production – Actual Fixed Overheads

$$\text{Standard Overhead Rate} = \frac{\text{Standard Fixed Overhead}}{\text{Standard Output}}$$

$$= \frac{\text{Rs. 2,000}}{\text{2,000 units}} = \text{Re. 1.}$$

Overheads Cost Variance = (1,800 × 1) – Rs. 2,250
= Rs. 1,800 – Rs. 2,250
= Rs. 450 Unfavourable

(b) Overheads Expenditure Variance

Actual Fixed Overheads – Budgeted (Standard) Fixed Overheads

Rs. 2,250 – Rs. 2,000 = Rs. 250 Unfavourable

(c) Overheads Volume Variance

Actual Output × Standard Rate

(1,800 ×1) – Rs. 2,000

Rs. 1,800 – Rs. 2,000 = Rs. 200 Unfavourable

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(*d*) Overheads Capacity Variance

Standard Rate (Revised Standard Units – Standard Units)

$$\text{Revised Standard Units} = \frac{2,000}{40 \text{ Hrs.}} \times 32 \text{ Hrs.}$$

$$= \frac{2,000}{40} \times 32 = 1,600 \text{ units}$$

Overheads Capacity Variance = 1 (1,600 units – 2,000 units)

= Rs. 400 Unfavourable

(*e*) *Overheads Efficiency Variance*

Standard Rate (Actual Quantity – Revised Standard Quantity)

Re. 1 (1,800 units – 1,600 units)

= Rs. 200 Favourable.

Problem 9.22. S. V. Ltd. has furnished you the following data :

	Budget	*Actual July 1996*
No. of Working days	25	27
Production in Units	20,000	22,000
Fixed Overheads	Rs. 30,000	Rs. 31,000

Budgeted fixed overhead rate is Re. 100 per hour. In July 1996, the actual hours worked were 31,500.

Calculate the following variances :

(*i*) Efficiency variance

(*ii*) Capacity variance

(*iii*) Calender variance

(*iv*) Volume variance

(*v*) Expenditure variance

(*vi*) Total overhead variance *(C. A. Inter)*

Solution :

$$\text{Budgeted Hours} = \frac{\text{Rs. } 30,000}{\text{Re. } 1} = 30,000 \text{ Hours}$$

(Overhead rate is Re. 1.00 per hour)

Budgeted production in units 20,000

$$\text{Standard time per unit} = \frac{30,000 \text{ Hours}}{20,000 \text{ units}} = 1.5 \text{ Hours}$$

$$\text{Standard rate per unit} = \frac{\text{Rs. } 30,000}{20,000 \text{ units}} = \text{Rs. } 1.50$$

(*i*) *Efficiency Variance*

Standard Overhead rate per hour (St. hours for actual output – Actual hours worked)

Re. 1 (33,000 – 31,500) = Rs. 1,500 Favourable

(Standard hours for actual production

= 22,000 × 1.5 = 33,000 Hrs.)

(*ii*) *Capacity Variance*

St. rate per hour (Actual hours – Budgeted hours for 27 days)

Re. 1 (31,500 – 32,400)= Rs. 900 Adverse $\left(\frac{30,000 \times 27}{25}\right)$

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(iii) Calender Variance

St. Rate × Increase in hours due to more actual working days.

Re. 1 (32,400 – 30,000) = Rs. 2,400

(iv) Volume Variance

Standard Rate per unit × Actual output-Budgeted overheads

1.50 × 22,000 – 30,000

Rs. 33,000 – Rs. 30,000 = Rs. 3,000 Favourable

(v) Expenditure Variance

Budgeted Overheads – Actual Overheads

Rs. 30,000 – Rs. 31,000 = Rs. 1,000 Adverse

(vi) Total Overhead Variance

Standard Rate × Actual output – Actual Overheads

1.50 × 22,000 – 31,000

Rs. 33,000 – Rs. 31,000 = Rs. 2,000 Favourable

Problem 9.23. A. S. Ltd operates a budgetary control and standard costing system, From the following data, calculate :

1. Sales Variance
2. Sales Volume Variance
3. Sales Price Variance

Product	*Standard cost of sales per unit*	*Standard selling prices per unit* Rs.	*Budgeted*		*Amount*	
			Units to be sold	*Sales Value* Rs.	*Units sold*	*Sales Value* Rs.
A	10.00	12.00	100	1,200	100	1,100
B	9.40	12.00	50	600	50	600
C	7.50	9.00	100	900	200	1,700
D	4.00	6.00	75	450	50	300
			325	3,150	400	3,700

(M. Com. Bombay)

Solution :

1. *Sales Variance*

   Actual Sales Value – Bugeted Value of Sales

   Rs. 3,700 – Rs. 3,150 = Rs. 550 Favourable

2. *Sales Volume Variance*

   Standard Price (Actual Quantity – Standard Quantity)

   A : 12 (100 – 100) = Nil

   B : 12 (50 – 50) = Nil

   C : 9 (200 – 100) = Rs. 900 Favourable

   D : 6 (50 – 75) = Rs. 150 Adverse

   Total Sales Volume Variance = Rs. 750 Favourable

3. Sales Price Variance

   Actual Quantity (Standard Price – Actual Price)

   A : 100 (12 – 12) = Rs. 100 Adverse

   B : 50 (12 – 12) = Nil

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C : 200 (8.50 – 9.00) = Rs. 100 Adverse
D : 5-0 (6 – 6) = Nil
Total Sales Price Variance = Rs. 200 Adverse

Verification

Sales Variance = Sales Volume Variance + Sales Price Variance
Rs. 550 (Fav.) = Rs. 750 (Fav.) + 200 (Adv.)
= 750 – 200
Rs. 550 Fav. = Rs. 550 Fav.

Problem 9.24. Following information is given about standard and actual sales :

	Standard		*Actual.*	
	Qty. *(units)*	Price per *unit* *Rs.*	Qty. *(units)*	Price per *unit* *Rs.*
X	500	5	500	5.00
Y	400	6	600	6.25
X	300	7	400	6.75

Solution :

(i) Sales Value Variance

Actual value of sales – Standard value of sales
Product X = (500 × 5) – (500 × 5)
= Rs. 2,500 – Rs. 2,500 = Nil
Product Y = (600 × 6.25) – (400 × 6)
Rs. 3,750 – 2,400 = Rs. 1,350 Favourable
Product Z = (400 × 6.75) – (300 × 7)
Rs. 2,700 – Rs. 2,100 = Rs. 600 Favourable
Total sales price variance = Rs. 1,950 Favourable

(ii) Sales Price Variance

Actual Quantity Sold (Actual Price – Standard Price)
Product X = 500 (5 – 5) = Nil
Product Y = 600 (6.25 – 6.00) = Rs. 150 Favourable
Product Z = 400 (6.75 – 7.00) = Rs. 100 Unfavourable
Total sales price variance = Rs. 50 Favourable

(iii) Sales Volume Variance

Standard Price (Actual Quantity – Standard Quantity)
Product X = 5 (500 – 500) = Nil
Product Y = 6 (600 – 400) = Rs. 1200 Favourable
Product Z = 7 (400 – 300) = Rs. 700 Favourable

(iv) Sales Price Variance

There is a difference between standard quantity and actual quantity ; so the standard will be revised in proportion to actual quantity of sales.

$$\text{Product X} = \frac{500}{1,200} \times 1,500 = 625$$

$$\text{Product Y} = \frac{400}{1,200} \times 1,500 = 500$$

$$\text{Product Z} = \frac{300}{1,200} \times 1,500 = 375$$

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Sales Mix Variance = Standard Value of Actual Mix – Standard Value of Revised Standard Mix

$(500 \times 5 + 600 \times 6 + 400 \times 7) - (625 \times 5 + 500 \times 6 + 375 \times 7)$

Rs. 8,900 – Rs. 8,750

= Rs. 150 Favourable

Problem 9.25. SK Ltd. furnishes the following information relation to budgeted sales and actual sales for March 1995 :

	Product	Sales Quantity (units)	Selling Price per unit
Budgeted Sales			Rs.
	A	1,500	10
	B	1,200	15
	C	2,000	25
Actual Sales			
	A	900	12
	B	1,300	14
	C	2,100	26

Calculate the following variances :

(i) Sales Volume Variance

(ii) Sales Price Variance

(iii) Total Sales Variance

Solution :

(i) Sales Volume Variance

Standard Price (Actual Quantity of sales – Budgeted Quantity of sales)

Product A : 10 (900 – 1500) = Rs. 6,000 Unfavourable

Product B : 15 (1200 – 1300) = Rs. 1,500 Favourable

Product C : 25 (2100 – 2000) = Rs. 2,500 Favourable

Total Sales Volume Variance = Rs. 2,500 Unfavourable

(ii) Sales Price Variances

Actual Quantity (Actual Price – Budgeted Price)

Product A : 900 (Rs. 12 – Rs. 10) = Rs. 1,800 Favourable

Product B : 1,300 (Rs. 14 – Rs. 15) = Rs. 1,300 Unfavourable

Product C : 2,100 (Rs. 26 – Rs. 25) = Rs. 2,100 Favourable

Total sales price variance = Rs. 2600 Favourable

(iii) Sales Value Variance

Actual Value of Sales – Budgeted Value of Sales

Actual value of sales :

$900 \times 12 + 1,300 \times 14 + 2,100 \times 26 = 10,800 + 18,200 + 54,600 =$ Rs. 83,600

Budgeted value of sales :

$1500 \times 10 + 1200 \times 15 + 2500 \times 25 = 15,000 + 18,000 + 50,000 =$ Rs. 83,000

Sales Value Variance = Rs. 83,600 – Rs. 83,000 = Rs. 600 Favourable

Verification : Sales Value Variance = Sales Volume Variance + Sales Price Variance

Rs. 600 Favourable = Rs. 2,000 Unfavourable + Rs. 2,600 Favourable

Rs. 600 Favourable = Rs. 600 Favourable

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Problem 9.26. Modern Toys Ltd. had budgeted the following sales for Dec. 1995.

Toy A 900 units @ Rs. 50 per unit
Toy B 650 units @ Rs. 100 per unit
Toy C 1,200 units @ Rs. 75 per unit

As against this, the actual sales were :

Toy A 1,000 units @ Rs. 55 per unit
Toy B 700 units @ Rs. 95 per unit
Toy C 1,100 units @ Rs. 78 per unit

The cost per unit of A, B and C was Rs. 45 Rs. 85 and Rs. 65 respectively. Calculate different variances to explain the differenc between budgeted and actual profit.

Solution :

(i) Total Sales Margin Variance

Actual Profit – Budgeted Profit
Actual Profit = Actual Quantity of sales × Actual profit per unit
Budgeted Profit = Budgeted Quantity of sales × Budgeted profit per unit

Actual Profit per unit

Toy A = Rs. 55 – Rs. 45 = Rs. 10
Toy B = Rs. 95 – Rs. 85 = Rs. 10
Toy C = Rs. 78 – Rs. 65 = Rs. 13

Standard profit per unit

Toy A = Rs. 50 – Rs. 45 = Rs. 5
Toy B = Rs. 100 – Rs. 85 = Rs. 15
Toy C = Rs. 75 – Rs. 65 = Rs. 10

Actual Profit = (1,000 × 10 + 700 ×10 + 1,100 × 13) = Rs. 31,300
Standard Profit = (900×5+650×15)+1,200×10=Rs. 26,250
Sales Margin Variance = Rs. 31,300 – Rs. 26,250
= Rs. 5,050 Favourable

(ii) Sales Margin Variance Due to Selling Price

Actual quantity of sales (Actual selling price per unit - Standard selling price per unit)

Toy A = 1,000 (Rs. 55 – Rs. 50) = Rs. 5,000 Favourable
Toy B = 700 (Rs. 95 – Rs. 100) = Rs. 3,500 Unfavourable
Toy C = 1,100 (Rs. 78 – Rs. 75) = Rs. 3,300 Favourable

Sales Margin Variance Due to Selling Price = Rs. 4,800 favourable

Sales Margin Variance Due to Volume

Standard Profit per unit (Actual Quantity of sales – Standard Quantity of sales)

Toy A : Rs. 5 (1,000 units – 900 units) = Rs. 500 Favourable
Toy B : Rs. 15 (700 units – 650 units) = Rs. 750 Favourable
Toy C : Rs. 10 (1,100 units - Rs. 1,200 units = Rs. 1,000 Unfavourable

Sales Margin Variance Due to volume = Rs. 250 Unfavourable

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Proble 9.27. From the information given below, calculate labour variances for the two departments :

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	Deptt A	*Deptt B*
	Rs.	*Rs.*
Actual gross wage	2,000	1,800
Standard hours produced	10,000	8,000
Standard rate per hour	30 paise	25 paise
Actual hours worked	8,000	6,000

Solution :

Actual Wage Rate

$$\text{Deptt A : } \frac{2,000}{8,000} = 0.25 \text{ P per hour}$$

$$\text{Deptt B : } \frac{1,800}{6,000} = 0.30 \text{ P per hour}$$

(a) Labour Cost Variance

Standard labour cost – Actual labour cost

Deptt. A : (10,000 × 0.30) – Rs. 2,000

Rs. 3,000 – Rs. 2,000 = Rs. 1,000 Favourable

Deptt. B : (8,000 × 0.25) – Rs. 1,800

Rs. 2,000 – Rs. 1,800 = Rs. 200 Favourable

(b) Labour Rate of Pay Variance

Actual hours worked (Standard Rate – Actual Rate)

Deptt. A : 8,000 (0.30 – 0.25) = Rs. 400 Favourable

Deptt. B : 6,000 (0.25 – 0.30) = Rs. 300 Adverse

(c) Labour Efficiency Variance

Standard Rate (Standard Time – Actual Time)

Deptt. A : 0.30 (10,000 – 8,000)= Rs. 600 Favourable

Deptt. B : 0.25 (8,000 – 6,000) = Rs. 500 Favourable

Problem 9.28. A gang of workers normally consists of 30 men, 15 women and 10 boys. They are paid at standard hourly rate as under

Men	Re. 0.80
Women	Re. 0.60
Boys	Re. 0.40

In a normal working week of 40 hours, the gang is expected to produce 2,000 units of output.

During the week ended 31st Dec., 1995, the gang cosisted of 40 men, 10 women and 5 boys. The actual wages paid were @ Re. 0.70, Re. 0.65 and Re. 0.30 respectively. 4 hours were lost due to abnormal idle time and 1,600 units were produced.

Calculate : *(i)* Wage Variance, *(ii)* Wages Rate Variance, *(iii)* Labour Efficiency Variance, *(iv)* Gang composition Variance, *(v)* Labour Idle Time Variance.

Solution :

Standard wages for 2,000 units of output

	Rs.
30 men @ Re. 80 per hour for 40 hours	960
15 women @ Re. 0.60 per hour for 40 hours	360
10 boys @ Re. 0.40 per hour for 40 hours	160
	1,480

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Standard cost of 1,600 units of actual output

$$= \frac{1,480}{2,000} \times 1,600 = \text{Rs. } 1,184$$

Standard time for men for 2,0090 units is

= 1,200 hours

Standard time for men for 1,600 hours of Actual output

$$= \frac{1,200}{2,000} \times 1,600 = 960 \text{ hours}$$

Standard time for women

$$= \frac{6,00}{2,000} \times 1,600 = 480 \text{ hours}$$

Standard time for boys

$$= \frac{4,00}{2,000} \times 1,600 = 320 \text{ hours}$$

Actual cost of labour :

	Rs.
40 men @ Re. 0.70 for 40 hours	1,120
10 women @ Re. 0.65 for 40 hours	260
5 boys @ Re. 0.30 for 40 hours	60
	1,440

Cost of actual labour mix at the standard rate :

	Rs.
40 men @ R. 0.80 for 40 hours	1,280
10 women @ Re. 0.60 for 40 hours	240
5 boys @ Re. 0.40 for 40 hours	80
	1,600

Idle Time	
40 men for 4 hours each	160 Hours
10 women for 4 hours each	40 Hours
5 boys for 4 hours each	20 Hours
	220 Hours

(i) Wages Variance

Standard cost of labour for actual output – Actual cost of labour

Rs. 1,184 – Rs. 1,440 = Rs. 256 Unfav.

(ii) Wage Rate Variance

Actual Time (Standard Rate – Actual Rate)

Men : 1,600 Hrs. (Re. 0.80 – Re. 0.70) + Rs. 160 Fav.

Women : 400 Hrs. (Re. 0.60 – Re. 0.65) = Rs. 20 Unfav.

Boys : 200 Hrs. (Re. 40 – Re. 0.30) = Rs. 20 Fav.

Total wage rate Variance = Rs. 160 Fav.

(iii) Labour efficiency Variance

Standard Rate (Standard time for actual output – Actual time for production)

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Men : Re 0.80 (960 Hrs – 1,440 Hrs.)	= Rs. 284 Unfav.
Women : R. 0.60 (480 Hrs. – 360) Hrs.)	= Rs. 72 Fav.
Boys : R. 0.40 (320 Hrs. – 180 Hrs.)	= Rs. 56 Fav.
Total Labour Efficiency Variance	= Rs. 256 Unfav.

Actual time utilised for production is actual time minus idle time.

(iv) *Labour Idle time Variance*

Idle Time × Standard Rate

Men : 160 × Re. 0.80	= Re. 128 unfav.
Women : 40 × Re. 0.60	= Rs. 24 unfav.
Boys : 20 × Re. 0.40	= Rs. 8 unfav.
Total Idle Time Variance	= Rs. 160 unfav.

(v) *Gang Composition Variance*

$$\left(\frac{\text{Total time of actual labour mix}}{\text{Total time of standard labour mix}} \times \text{standared cost of standard labour mix}\right)$$

– Standard cost of actual labour mix

$$= \left(\frac{2{,}000 \text{ Hours}}{2{,}200 \text{ Hours}} \times \text{Rs. } 1{,}480\right) - \text{Rs. } 1{,}600$$

Rs. 120 unfav.

Problem 9.29. Operating and accounting figures for the month of January, 1996, with repect to overheads are :

	Rs.
Actual Overheads	8,600
Actual direct labour hours	6,000
Standard labour hours	5,500

Budget equation = Rs. 3,000 + 0.90 P × Actual direct labour hours)

Absorption equation = Rs. 1.50 × Sandard direct labour hours

(Thus budgeted overheads amount to Rs. 8,400 and absored overheads to Rs. 8,250)

Find out Volume, Spending and efficiency Overhead Variances.

(M. Com. Raj.)

Solution :

		Rs.
Actual Overheads		8,600
Actual direct labour hours		6,000
Standard labour hours for actual production	$= \frac{\text{Rs. } 8{,}250}{\text{Rs. } 1.50}$	= 5,500
Standard labour hours for the period	$= \frac{8{,}400}{1.50}$	= 5,600
Budgeted Overheads		= 8,400
Absorbed Overheads		= 8,250

Overhead Spending

(Budget Variance) = Budgeted Overheads – Actual Overheads

= Rs. 8,400 – Rs. 8,600 = Rs. 200 Unfavourable

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Overhead Efficiency Variance

Standard Overhead Rate (Standard hours for actual production – Actual hours worked)

Re. 1.50 (5,500 – 6,000)=Rs. 750 Unfavourable

Overhead Volume Variance

Standard overhead Rate (Actual hours – standard hours for the period)

Rs. 1.50 (6,000 – 5,600) = Rs. 600 Favourable

Overhead Cost Variance

Standard hours for actual production × Standard Overhead Rate – Actual Overheads

(5,500 ×1.50) – Rs. 8,600

Rs. 8,250 – Rs. 8,600 = Rs. 350 Unfavourable

Problem 9.30. The standard cost card for a product shows as thus :

	Per unit
	Rs.
Material cost – 2 kg. @ Rs. 2.50 each	5.00
Wages – 2 hours @ 0.50 P. each	1.00

The actual which emerged from business operations are as follows :

Production	8000	*units*
Material Consumed	*Rs.*	
16,500 Kg. @ Rs. 2.40 each	39,600	
Wages Paid-		
18,000 hours @ 40 P. each	7,200	

Calculate appropriate material and labour variances.

[B. Com. (Hons.) Delhi]

Solution :

Material Cost Variance

Standard Material Cost – Actual Material Cost

(8,000 Units × 2 kg. × Rs. 2.50) – (16,500 Kg. × Rs. 2.40)

= Rs. 400 Favourable

Material Price Variance

Actual Quantity (Standard Price – Actual Price)

16,500 (2.50 – 2.40) = Rs. 1,650 Favourable

Material Usage Variance

Standard Price (Standard Quantity – Actual Quantity)

2.50 (16,000 – 16,500) = Rs. 1,250 Adverse

Labour Cost Variance

Standard Labour Cost – Actual Labour Cost

(8,000 units × 2 Hours × Re. 0.50) – (18,000 hrs. × Re. 0.40)

(8,000 – 7,200) = Rs. 800 Favourable

Labour Rate Variance

Actual Hours (Standard Rate – Actual Rate)

18,000 (0.50 – 0.40) = Rs. 1,800 Favourable

Labour Efficiency Variance

Standard Rate (Standard Hours – Actual Hours)

0.50 (16,000 – 18,000) = Rs. 1,000 Adverse

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Problem 9.31. In a factory the standard units of production for the year were fixed at 1,20,000 units and estimated overhead expenditure was estimated to be

	Rs.
Fixed overheads	12,000
Variable overheads	6,000
Semi-variable overheads	1,800

Actual production during March of the year was 8,000 units.

Each month has 20 working days. During the month in question there was one statutory holiday. The actual overheads amounted to :

	Rs.
Fixed Overheads	1,190
Variable Overheads	480
Semi-variable Overheads	190

Semi-variable charges are considered to include 60 per cent expenses of fixed nature and 40 per cent of variable nature.

Find out expenditure, volume and calendar variance.

(C.A. Inter)

Solution :

1. *Expenditure Variance :*

Variable Overheads Variance = Actual Output × Standard Variable Overhead Rate – Actual Variable Overheads

$$= 8,000 \text{ units} \times 0.056 - 556$$

$$= 448 - 556 = \text{Rs. } 108 \text{ Unfavourable.}$$

$$\text{Variable Overheads Rate} = \frac{6,000 + 40\% \text{ of } 1,800}{1,20,000 \text{ units}}$$

$$= \frac{6,720}{1,20,000} = 0.056$$

Fixed Overheads Expenditure Variance = Budgeted Fixed Overheads-Actual Overheads

$$= \text{Rs. } 1,090 - \text{Rs. } 1,304 = \text{Rs. } 214 \text{ Unfavourable (1)}$$

(2) Volume Variance = Actual Output × Fixed Overheads Rate – Budgeted Fixed Overheads

$$8,000 \times 0.109 - 1,090$$

$$872 - 1090 = \text{Rs. } 218 \text{ Unfavourable}$$

$$\text{Fixed Overheads Rate} = \frac{12,000 + 60\% \text{ of } 1,800}{1,20,000}$$

$$= \frac{13,080}{1,20,000} = 0.109$$

(3) Calender Variance = Standard Rate (Revised Budgeted Units Budgeted Units)

$$= 0.109\ (9,500 - 10,000) = \text{Rs. } 54.50 \text{ Unfavourable}$$

$$\text{Revised Budgeted Units} = \frac{10,000}{20} \times 9$$

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Working :

Budgeted Overheads = 12,000 + 60% of 1,800
= 12,000 + 1,080 = Rs. 13,080

Monthly Budgeted Overheads = $\frac{13,080}{12}$ = Rs. 1,090

Problem 9.32. From the following particulars find out the following variances.

(i) Materials Price Variance
(ii) Materials Usage Variance
(iii) Materials Cost Variance

Quantity of materials purchased	3,000 units
Value of materials purchased	Rs. 9,000
Standard quantity of materials required per ton of finished product	25 units
Standard rate of material	Rs. 2 per unit
Opening stock of material	Nil
Closing stock of material	500 units
Finished production during the year	80 tonnes

(B. Com. Hons. Delhi)

Solution :

Actual quantity used = Opening stock of materials + Purchases – Closing stock of materials
= Nil + 3,000 units – 500 units = 2,500 units

Standard quantity = Standard quantity required per ton × Actual Output
= 25 × 80 = 2,000 units

Actual price per unit = $\frac{9,000}{3,000}$ = Rs. 3

(i) Materials Price Variance : Actual Usage (Standard Price – Actual Price)
: 2,500 units (2 – 3) = Rs. 2,500 Unfavourable

(ii) Materials Usage Variance : Standard Price (Standard quantity – Actual quantity)
Rs. 2 (2,000 – 2,500) = Rs. 1,000 Unfavourable

(iii) Materials Cost Variance = Standard Material Cost – Actual Material Cost
Standard quantity × Standard Rate – Actual Quantity × Actual Rate
2,000 × 2 – 2,500 × 3
4,000 – 7,500 = Rs. 3,500 unfavourable

Problem 9.33. In a factory section there are 80 workers and the average rate of wages per worker is Re. 0.50 per hour. Standard working hours per week are 45 and the standard performance is 60 units per hour.

During the four weeks in February, wages paid for 40 workers were Re. 0.50. per hour, for 15 workers Re. 0.60 per hour, and 25 workers Re. 0.40 per hour. The section did not work for 4 hours due to breakedown of machinery.

Calculate labour rate variance for the section for the 4 weeks.

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Solution :

The workers will be paid for all the 45 hours even though they did not work for 4 hours due to breakdown of machinery because wages paid for idle time are also included.

Labour Rate Variance

Actual time (Standard Rate – Actual Rate)

(a) First Category :

Actual time = 40 workers working for 4 weeks of 45 hours each
= $40 \times 4 \times 45 = 7,200$ hours
= 7,200 hours (50 P. – 50 P.) = Nil

(b) Second Categotry :

Actual time = 15 workers working for 4 weeks of 45 hours each
= $15 \times 4 \times 45 = 2,700$ hours
2,700 hours (50 Paise – 60 Paise) = Rs. 270 Unfavourable

(c) Third Category :

Actual time = 25 workers working for 4 weeks at 45 hours each
= $25 \times 4 \times 45 = 4,500$ hours
4,500 hours (50 Paise – 40 Paise) = Rs. 450 Favourable
Total Labour Rate Variance = *(a)* + *(b)* + *(c)*
= Nil + 270 Unfavourable + 450 Favourable
= Rs. 180 Favourable.

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10

Budgeting and Budgetary Control

Problem 10.1. The budgeted expenses for the production of 10, 000 units in a factory are furnished below.

	Per Unit
	Rs.
Materials	70
Labour	25
Variable Overheads	20
Fixed Overheads (1,00,000)	10
Direct Variable Overheads	5
Selling expenses (15% fixed)	13
Distribution expenses (20% fixed)	7
Administrative expenses (Rs. 50, 000)	5
	155

Prepare a budget for the production of 8,000 units.

Note. Administrative expenses should be taken as fixed.

Solution :

FLEXIBLE BUDGET

Particulars	*Output 10, 000 Units*		*Output 8, 000 Units*	
	Per unit	*Amount*	*Per Unit*	*Amount*
	Rs.	*Rs.*	*Rs.*	*Rs.*
Materials	70. 00	7,00, 000	70, 00	5, 60, 000
Labour	25. 00	2,50, 000	25. 00	2, 00, 000
Direct Variable Overheads	5. 00	50, 000	5. 00	40, 000
Prime cost	100. 00	10, 00, 000	100. 00	8, 00, 000
Factory Overheads..	20. 00	2, 00, 000	20. 00	1, 60. 000
Variable Overheads				
Fixed overheads	10. 00	1, 00, 000	12. 50	1, 00, 000
Works Cost	130. 00	13, 00, 000	132. 50	10, 60, 000
Administrative expenses (assumed fixed)	5. 00	50. 000	6.25	50, 000
Cost of Production	135. 00	13, 50, 000	138. 75	11, 10, 000
Selling expenses				
Fixed - 15% of Rs. 13	1. 95	19, 500	2. 437	19, 500
Variable - 85% of Rs. 13	11.05	1, 10, 500	11. 05	88, 400
Distribution expenses				
Fixed - 20% of Rs. 7	1.40	14,000	1.75	14.000
Variable - 80% of Rs. 7	5. 60	56, 000	5. 60	44, 800
Total Cost of Sales	155. 00	15, 50, 000	159. 587	12, 76, 700

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Problem 10.2. Draw up a flexible budget for overhead expenses on the basis of the following data and determine the overhead rates at 70%, 80% and 90% plant capacity.

	At 70% Capacity Rs.	*At 80% Capacity Rs.*	*At 90% Capacity Rs.*
Variable Overheads:			
Indirect labour	–	12, 000	–
Stores including spares	–	4, 000	–
Semi -variable Overheads			
Power	–	20, 000	–
(60% fixed, 40% variable)			
Repairs and maintenance	–	2, 000	–
(60% fixed 40% variable)	–		–
FIxed Overheads	–		–
Depreciation	–	11, 000	–
Insurance	–	3, 000	–
Salaries	–	10, 000	–

Estimated direct labour hours – 1, 24, 000 Hours.

Solution :

FLEXIBLE BUDGET FOR OVERHEAD EXPENSES

	At 70% Capacity	*At 80% Capacity*	*At 90% Capacity*
	Rs.	*Rs.*	*Rs.*
Variable Overheads :			
Indirect labour	10, 500	12, 000	13, 500
Stores including spares	3, 500	4, 000	4, 500
Semi Variable Overheads:			
Power 60% Fixed	12, 000	12, 000	12, 000
40% variable	7, 000	8, 000	9, 000
Repairs and Maintenance:			
60% Fixed	1, 200	1, 200	1, 200
40% Variable	700	800	900
Fixed Overheads:			
Depreciation	11, 000	11, 000	11, 000
Insurance	3, 000	3, 000	3, 000
Salaries	10, 000	10, 000	10, 000
Total overhead expenses	58, 900	62, 000	65, 100
Estimated direct labour hours	1, 08, 500	1, 24, 000	1, 39, 500
Overhead rates	58,900 / 1,08,500	62,000 / 1,24,000	65,100 / 1,39,500
	0.54	=0.50	=0 466

Problem 10.3. Production costs of Oriental Enterprises Limited are as follows

Level of Activity

	60%	70%	80%
Output (in Units)	1, 200	1, 400	1, 600
Cost (Rs.)			
Direct materials	24, 000	28, 000	32, 000
Direct labour	7,200	8,400	9,600
Factory overhead	12,800	13,600	14,400
Work Cost	44, 000	50, 000	56, 000

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A proposal to increase production to 90% level of activity is under the consideration of management. The proposal is not expected to involve any increase in fixed factory overheads Prepare a statement showing the prime cost, total marginal cost and total factory cost at 90% level of activity.

[B. Com. (Hons.) Delhi]

Solution :

ORIENTAL ENTERPRISES LIMITED

Statement Showing cost at Various Levels of Activities

	Level of Activity			
	60%	*70%*	*80%*	*90%*
Output (in Units)	*Rs.* 1, 200	*Rs.* 1, 400	*Rs.* 1, 600	*Rs.* 1, 800
Direct Material	24, 000	28, 000	32, 000	36, 000
Direct labour	7, 200	8, 400	9, 600	10, 800
Prime Cost	31, 200	36, 400	41, 600	46, 800
Variable Factory Overhead	4, 800	5, 600	6, 400	7, 200
Total Marginal Cost	36, 000	42, 000	48, 000	54, 000
Fixed Factory Overhead	8, 000	8, 000	8, 000	8, 000
Total Factory Overhead	44, 000	50, 000	56, 000	62, 000

Problem 10.4. The following overhead expenses relate to a cost centre at 50% of normal capacity. Draw up a flexible budget for the cost centre for operating at 75%, 100% and 125% of normal capacity.

Indicate the basis and assumptions uopn which various expenses are divided.

	Rs..
Foreman	100
Assistant Foreman	40
Inspectors	65
Shop Labourers	50
Machinery Repairs	120
Defective Work	25
Consumable Stores	20
Overtime Bonus	–
Machine Depreciation	140

Solution :

FLEXIBLE BUDGET

	50%	*75%*	*100%*	*125%*	*Basis of apportionment*
	Rs.	*Rs.*	*Rs.*	*Rs.*	
Foreman	100	100	100	100	Fixed
Assistant Foreman	40	60	80	100	Semi-Variable
Inspectors	65	105	130	150	Semi-Variable
Shop Labourers	50	75	100	125	Variable
Machinery repairs	120	175	230	270	Semi-variable
Defective Work	25	40	60	90	Proportionately
Consumable Stores	20	30	40	50	Variable
Overtime Bonus	–	–	–	100	Work -load
Machine Depreciation	140	140	140	140	Fixed
	560	725	880	1,125	

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Note : Semi-variable expenses increase with the increse in output but the rate of increase is normally less than the increase in output. So such expenses are assumed to have increased at a different rate.

Problem 10. 5 A factory is currently working to 50% capacity and produces 10,000 units, Estimate the profits of the company when it works at 60% and 80% capacity and offer your critical comments.

At 50% working raw material cost increases by 2% and selling price falls by 2%. At the 80% working, raw material cost increases by 5% and selling price falls by 5%.

At 50% capacity working the product costs Rs. 180 per unit and is sold at Rs. 200 per unit.

The unit cost of Rs. 180 is made up as follows:

	Rs.
Material	100
Labour	30
Factory Overhead	30 (40% fixed)
Administrative Overhead	20 (50% fixed)

(ICWA Inter)

Solution :

	Output : 10, 000 Units, 50% Capacity		*Output : 12, 000 Units, 60% Capcity*		*Output 16, 000 Units, 80% Capacity*	
	Per unit	*Total*	*Per Unit*	*Total*	*Per Unit*	*Total*
	Rs.	*Rs.*	*Rs.*	*Rs.*	*Rs.*	*Rs*
Sales value	200	20,00,000	196	23,52, 000	190	30, 40, 000
Material Cost	100	10, 00,000	102	12, 24, 000	105	16, 80, 000
Labour Cost	30	3, 00, 000	30	3, 60, 000	30	4, 80, 000
Variable Factory Overhead	18	1, 80. 000	18	2, 16, 000	18	2, 88, 000
Fixed Factory Overhead	12	1, 20, 000	10	1, 20, 000	7. 50	1, 20, 000
Variable Adm. Overhead	10	1, 00, 000	10	1, 20, 000	10	1, 60, 00
Fixed Adm. Ovhead	10	1, 00, 000	8, 33	1, 00, 000	6. 25	1, 00, 000
Total Cost	180	18, 00, 000	178, 33	21, 40, 000	176, 25	28, 28, 000
Profit	20	2, 00, 000	17.67	2, 12, 000	13.25	2, 12, 000

Working Notes :

Factory Overhead : Rs 30

Fixed (40%) Rs. 12 : 10, 000 x 12 = Rs. 1, 20,000

Variable (60%) Rs. 18 per unit

Administrative Overhead : Rs. 20

Fixed (50%) Rs. 10: 10, 000 x 10 = Rs. 1, 00, 000

Variable(50%) Rs. 10 per unit.

Problem 10.6. The cost of an article at capacity level of 5, 000 units is given under A. For a variation of 25% in capacity above or below this level, the individual expenses vary as indicated under B Below :

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	A		B
	Rs.		
Material Cost	25, 000	100 %	varying
Labour Cost	15, 000	100 %	varying
Power	1, 250	80%	varying
Repairs and Maintenance	2, 000	75%	varying
Stores	1, 000	100%	varying
Inspection	500	20%	varying
Depreciation	10, 000	100%	Fixed
Administration Overheads	5, 000	25%	varying
Selling Overheads	3, 000	50%	varying
	62, 750		
Cost per unit Rs.	12. 55		

Find the unit cost of the product under each individual expenses and production levels of 4, 000 units and 6, 000 units.

Solution :

FLEXIBLE BUDGET

	4, 000 Units		*5, 000 Units*		*6, 00 Units*	
	Cost per Unit	*Amount*	*Cost per Unit*	*Amount*	*Cost per Unit*	*Amount*
	Rs.	*Rs.*	*Rs.*	*Rs.*	*Rs.*	*Rs.*
Material Cost	5.00	20,000	5.00	25,000	5.00	30,000
Labour Cost	3, 00	12, 000	3.00	15, 000	3. 00	18, 000
Prime Cost	8. 00	32, 000	8. 00	40, 000	8. 00	48, 00
Power	0. 26	1. 050	0. 25	1, 250	0. 24	1.450
Repairs and Maintenance	0. 43	1, 700	0. 40	2, 000	0. 38	2, 300
Stores	0.20	800	0. 20	1, 000	0. 20	1, 200
Inspection	0. 12	480	0. 10	500	0. 09	520
Depreciation	2. 50	10, 000	2. 00	10, 000	1. 67	10, 000
Cost of production	11. 51	46, 030	10. 95	54, 750	10. 58	63, 470
Administrative Overheads	1. 19	4, 750	1. 00	5, 000	0. 87	5, 250
Selling Overheads	0. 67	2, 700	0. 60	3, 000	0. 55	3, 300
Total Cost	13. 37	53, 480	12. 55	62, 750	12. 00	72, 020

Problem 10. 7. The following data are available in a manufacturing company for a yearly period :

	Rs. lakhs)
Fixed expenses:	
Wages and Salaries	9. 50
Rent, rates and taxes	6. 60
Depreciation	7. 40
Sundry administrative expenses	6. 50
Semi - Variable expenses :	
(at 50% of capacity)	
Maintenance and repairs	3. 50

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Indirect labour	7.90
Sales department expenses	3.80
Sundry administrative expenses	2.80
Variable expenses:	
(at 50% of capacity)	
Materials	21.70
Labour	20.40
Other expenses	7.90
	98.00

Assume that the fixed expenses remain constant for all levels of production, semi-variable expenses remain constant between 45% and 65% of capacity, increasing by 10% between 65% and 80% capacity and by 20% between 80% and 100% capacity. Sales at various levels are:

	(Rs. lakhs)
50 % Capacity	100
60% Capacity	120
75% Capacity	150
90% Capacity	180
100% Capacity	200

Prepare a flexible budget, for the year and forecast the profits at 60%, 75% and 100% capacity. *(I. C. W. A. Inter)*

Solution :

FLEXIBLE BUDGET

	50% Capacity	*60% Capacity*	*75% Capacity*	*90% Capacity*	*100% Capacity*
	Rs. (lakhs)	*Rs. (lakhs)*	*Rs. (lakhs)*	*Rs. (lakhs*	*Rs. (lakhs)*
Variable expenses:					
Materials	21.70	26.04	32.55	39.06	43.40
Labour	20.40	24.48	30.60	36.72	40.80
Other expenses	7.90	9.48	11.85	14.22	15.80
Semi-Variable Expenses					
Maintenance and repairs	3.50	3.50	3.85	4.20	4.20
Indirect labour	7.90	7.90	8.69	9.48	9.48
Sales department salaries	3.80	3.80	4.18	4.56	4.56
Sundry administrative expenses	2.80	2.80	3.08	3.36	3.36
Fixed Expenses					
Wages and salaries	9.50	9.50	9.50	9.50	9.50
Rent, rates and taxes	6.60	6.60	6.60	6.60	6.60
Depreciation	7.40	7.40	7.40	7.40	7.40
Sundry administrative expenses	6.50	6.50	6.50	6.50	6.50
Total Estimated Cost	98.00	108,00	124.80	141.60	151.60
Estimated profit	2.00	12.00	25.20	38.40	48.40
Sales	100.00	120.00	150.00	180.00	200.00

Problem10.8. The production costs of a factory are given as follows :

	Rs.
Direct Wages	90, 000
Direct Material	1, 20, 000

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Production overheads	: Fixed	40, 000
	: Variable	60, 000

During the forthcoming year it is anticipated that:

(a) Average rate for direct labour remuneration will fall from Re. 0.90 per hour to Re. 0.75 per hour.

(b) Production efficiency will be reduced by 5%

(c) Price per unit of direct material and of other materials and services which comprise overheads will remain unchanged;

(d) Direct labour hours will increase by $33^1/_3\%$. Draw up a budget.

Solution :

Increase in production is calculated as follows:

Output in the previous year	100%
Increase due to increase in labour hours	$33^1/_3\%$
	$133^1/_3\%$
Less: 5% decline in production efficiency $\left(133\frac{1}{3} \times \frac{5}{100}\right)$	$6^2/_3\%$
	$126^2/_3\%$

Output will increase by $26^2/_3\%$

BUDGET FOR THE FORTHCOMING YEAR

		Rs.	Rs.
Direct materials last year		1, 20, 000	
Add : $26\frac{2}{3}\%$ Increase in materials due to increase in output $1,20,000 \times \frac{80}{3 \times 100}$		32,000	
			1, 52, 000
Direct Wages:			
Labour hours last year		1, 00, 000	
Increase in labour hours		1, 00, 000	
Total labour hours		3	
$1,00,000 + \frac{1,00,000}{3}$		4,00,000	
		3	
Wages @ 0. 75 paise per hour $\left(\frac{4,00,000}{3} \times \frac{75}{100}\right)$			1, 00, 000
Prime Cost			2, 52, 000
Production Overheads:			
Fixed		40, 000	
Variable	60,000		
Add : $26\frac{2}{3}\%$ increase due to increase in production $60,000 \times \frac{80}{3} \times 100$	16,000		
		76,000	
			1,16,000
Estimated Works Cost			3, 68, 000

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Notes: Number of labour hours last year – $\frac{90,000}{90 \text{ paise}} = 90,000 \times \frac{100}{90}$
= 1,00,000 hours.

Problem 10. 9. Jamuna Printing Co. Pvt. Ltd. ended with the following profit/ Loss during the year 1996

(Rs. in lakhs)

	Sales		35. 58
Less :	Expenses.		
	Raw material	7. 42	
	Stores	4. 88	
	Expenses	20. 40	
	Interest	2. 00	
	Depreciation	2. 00	
			36. 70
	Loss for the year		1.12

The press had been working at 60% of capacity during 1996. Of the expenses of Rs. 20.40 lakhs, 25% is variable.

In 1997, production/sales volume at 80% of capacity is expected to be achieved. Fixed cost however, is expected to increase by. 1.20 lakhs.

Draw the 1997 budget *(I. C. W. A. . Inter)*

Solution :

BUDGET FOR THE YEAR 1997

		Rs.
Sales (80% Capacity)		47,44,000
Raw materials (variable)	9,89,333	
Stores (Variable)	6,50,667	
Expenses (Semi-varibale)	22,10,000	
Fixed Cost : Interest and depreciation	5,20,000	
		43,70,000
Budgeted profit		3,74,000

Working Notes : *Rs.*

Sales $35,58,000 \times \frac{80}{60}$ 47,44,000

Raw Materials $7,42,000 \times \frac{80}{60}$ 9,89,333

Stores $4,88,000 \times \frac{80}{60}$ 6,50,667

Expenses Rs. $15,30,000 + \text{Rs. } 5,10,000 \times \frac{80}{60}$ 22,10,000

Fixed Cost Rs. 2,00,000 + Rs. 2,00,000 + Rs. 1,20,000 =Rs. 5,20,000

Problem 10.10. The following information has been made available from the accounting records of Payment Precision Tools Limited for the last six months of 1995 (and of only the sales for January 1996) in respect of Fishplate XS-M-E 2025 Grade produced by it :

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(i) The Unit to be sold in different months are :

July	2,200	November	5,000
August	2,200	December	4,600
September	3,400	January, 96	4,000
October	3,800		

(ii) There will be no work -in-progress at the end of any month.

(iii) Finished units equal to half the sales for the next month will be in stock at the end of every month (including June, 1995)

(iv) Budgeted production and production costs for the year ending Dec., 1995 are as thus :

Production (units)	44,000
Direct materials per unit	Rs. 10.00
Direct wages per unit	Rs. 4.00
Total factory overheads apportioned to product	Rs. 88, 000

In is required to prepare :

(a) Production Budget for the last six months of 1995; and

(b) Production Cost Budget for the same period.

[Adapted from I.C.W.A. Inter]

Solution :

(a) **PRODUCTION BUDGET**

(for July to December 1995) *(In units)*

	July,	*Aug.*	*Sep.*	*Oct.*	*Nov.*	*Dec.*	*Total*
Estimated sales	2,200	2,200	3,400	3,800	5,000	4,600	21,200
Add : Stock at the end	1,100	1,700	1,900	2,500	2,300	2,000	11,500
	3,300	3,900	5,300	6,300	7,300	6,600	32,700
Less : Stock at the beginning	1,100	1,100	1,700	1,900	2,500	2,300	10,600
Production required	2,200	2,800	3,600	4,400	4,800	4,300	22,100

(b) **PRODUCTION COST BUDGET**

(for July to December 1995) *(In Rs.)*

	July,	*Aug.*	*Sep.*	*Oct.*	*Nov.*	*Dec.*	*Total*
Direct materials @ Rs. 10	22,000	28,000	36,000	44,000	48,000	43,000	2,21,000
Direct wages @ Rs. 4	8,800	11,200	14,400	17,600	19,200	17,200	88,400
Factory overheads @ Rs. 2	4,400	5,600	7,200	8,800	9,600	8,600	44,200
Total Ptroduction Cost	35,200	44,800	57,600	70,400	76,800	68,800	3.53,600

Note : Factory overheads per unit = $\frac{\text{Rs. } 88{,}000}{44{,}000 \text{ units}}$ Rs. 2

Problem 10.11. A company manufactures two products A and B.A. forecast of the number of units to be sold in the first six months of the year is given below :

	Product A	Product
January	1,500	3,000
February	1,700	3,000

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March	2,100	2,600
April	2,500	2,200
May	2,900	1,800
June	2,900	2,000

It is anticipated that *(i)* there will be no work-in-progress at the end of any month, *(ii)* finished units equal to half the sales for the next month will be in stock at the end of each month (including the previous December).

Budgeted production and prodiction costs for the whole year are as follows :–

	Product A	*Product B*
Production (units)	25,000	26,000
Per unit : Direct material	Rs. 13.00	18.50
Direct labour	Rs. 5.50	8.00
Total factory overhead for the year	Rs. 75,000	1,04,000

Prepare for five months ending May 31, a production budget for each month and a summarised cost budget.

Solution :

PRODUCTION BUDGET

(for five months ending May, 31)

	Jan.	*Feb.*	*March*	*Apr.*	*May*
Production A	*Units*	*Units*	*Units*	*Units*	*Units*
Sales	1,500	1,700	2,100	2,500	2,900
Add : Opening stock (half the sales for next month)	850	1,050	1,250	1,450	1,450
	2,350	2,750	3,350	3,950	4,350
Less : Opening stock (half the sales current month)	750	850	1,050	1,250	1,450
Budgeted Production	1,600	1,900	2,300	2,700	2,900
Product B					
Sales	3,000	3,000	2.600	2,200	1,800
Add : Closing stock (half the sals for next month)	1,500	1,300	1,100	900	1,000
	4,500	4,300	3,700	3,100	2,800
Less : Opening stock half the sales for current month)	1,500	1,500	1,300	1,100	900
Budgeted Production	3,000	2,800	2,400	2,000	1,900

Total budgeted production of Product A

= 1,600 + 1,900 + 2,300 + 2,700 + 2,900 = 11,400

Total budgeted production of Product B

= 3,000 + 2,800 + 2,400 + 2,000 + 1,900 = 12,100

SUMMARISED PRODUCTION COST BUDGET

	Product A (11,400 Units)		*Product B (12,100 Units)*	
	Per Unit	*Amount*	*Amount*	*Amount*
	Rs.	*Rs.*	*Rs.*	*Rs.*
Direct materials	13.00	1,48,200	18.50	2,23,850
Direct labour	5.50	62,700	8.00	96,800
Prime cost	18.50	2,10,900	26.50	3,20,650
Factory overheads :	3.00	34,200	4.00	48,400
Cost of Production	21.50	2,45,105	30.50	3,69,050

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Working Note :

Factory Overheads per unit

$$= \frac{\text{Annual overhead}}{\text{Annual output}}$$

$$\text{Product A} = \frac{\text{Rs. } 75{,}000}{25{,}000} = \text{Rs. } 3$$

$$\text{Product B} = \frac{\text{Rs. } 1{,}04{,}000}{26{,}000} = \text{Rs. } 4$$

Problem 10.12. Following information is given about a Ltd. concern you are required to prepare a Selling Overheads Budget :

	Rs.
Advertisement	2,000
Salaries of sales department	2,000
Expenses of sales department (fixed)	950
Salesman's remuneration :	
Salaries	6,000
Commission @ 1% on sales affected	
Carriage Outwards : Estimated @ 5% on Sales	
Agent's Commission 6% on sales	
Sales during the period were estimated as follows :	
Rs. 1,00,000 including Agent's sales Rs. 10,000	
Rs. 1,50,000 including Agent's sales Rs. 20,000	
Rs. 2,00,000 including Agent's sales Rs. 20,000	

Solution :

SALES OVERHEADS BUDGET

For (the Period .....)

	Rs.	*Rs.*	*Rs.*
Estimated sales :	1,00,000	1,50,000	2,00,000
Fixed Overhead :			
Advertisement	2,000	2,000	2,000
Salaries of sales department	2,000	2,000	2,000
Expenses of sales department (fixed)	950	950	950
Salaries of Salesmen	6,000	6,000	6,000
Variable Overheads :	10,950	10,950	10,950
Salesman's Commission	900	1,300	1,800
Carriage outwards	5,000	7,500	10,000
Agent's Commission	600	1,200	1,200
Total Overheads	17,450	20,950	23,950

Problem 10.13. Gama Engineering Company Limited manufactured two products X and Y. An estimate of the number of units expected to be sold in the first seven month of 1996 is given below :

	Product X	*Product Y*
January	500	1,400
February	600	1,400
March	800	1,200
April	1,000	1,000
May	1,200	800
June	1,200	800
July	1,000	900

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It is anticipated that :

(a) There will be no work-in-progress at the end of any month.

(b) inished units equal to half the enticipated sales for the next month will be in stock at the end of each month (including December 1995).

The budgeted proudction and production cost for the year ending 31st December, 1996 are as follows :

	Product X	*Product Y*
Production (units)	11,000	12,000
Direct materials per unit (Rs.)	12	19
Direct wages per unit (Rs.)	5	7
Other manufacturing charges apportionable to each type of product (Rs.)	33,000	48,000

You are required to prepare :

(a) a production budget showing the number of units to be manufacture each month.

(b) a summarised production cost budget for 6 months period – January to June 1996. *(C.A. Final)*

Solution :

GAMA ENGINEERING COMPANY LIMITED

Production Budget (in units) for the six months ending June 30, 1996

Product X	*Jan*	*Feb.*	*March*	*April*	*May*	*June*
Closing stock	300	400	500	600	600	500
Sales	500	600	800	1,000	1,200	1,200
	800	1,000	1,300	1,600	1,800	1,700
Less : Opening stock	250	300	400	500	600	600
Production (in units)	550	700	900	1,100	1,200	1,100
Product Y						
Closing stock	700	600	500	400	400	450
Sales	1,400	1,400	1,200	1,000	800	800
	2,100	2,000	1,700	1,400	1,200	1,250
Less : Opening Stock	700	700	600	500	400	400
Production (in units)	1,400	1,300	1,100	900	800	850

SUMMARISED PRODUCTION COST BUDGETS

(For 6 months ending June 30, 1996)

	X		*Y*	
Production (in units)	5,550		6,350	
	Unit Cost Rs.	*Total* Rs.	*Unit Cost* Rs.	*Toal* Rs.
Direct materials	12	66,600	19	1,20,650
Direct wages	5	27,750	7	44,450
Manufacturing charges	3	16,650	4	25,400
	20	1,11,000	30	1,90,500

Notes :

Manufacturing charges have been on the basis of production

Manufacturing charges per unit

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$$X = \frac{\text{Rs. } 33,000}{11,000 \text{ Units}} = \text{Rs. } 3$$

$$X = \frac{\text{Rs. } 48,000}{12,000 \text{ Units}} = \text{Rs. } 4$$

Problem 10.14. The income and expending forcasts for months March to August, 1995 are given as follows :

Month	*Sales (Credit)*	*Purchases (Credit)*	*Manufac-turing Wages*	*Manufac-turing expenses*	*Office expenses*	*Selling expenses*
	Rs.	*Rs.*	*Rs.*	*Rs.*	*Rs.*	*Rs.*
March	60,000	36,000	9,000	3,500	2,000	5,000
April	62,000	38,000	8,000	3,750	1,500	5,000
May	64,000	33,000	10,000	4,000	2,500	4,500
June	58,000	35,000	8,500	3,750	2,000	3,500
July	56,000	39,000	9,500	5,000	1,000	3,500
August	60,000	34,000	8,000	5,200	1,500	4,500

You are given the following further information :

(a) Plant costing Rs. 16,000 is due for delivery in July payable 10% on delivery and the balance after 3 months.

(b) Advance tax of Rs. 8,000 is payable in March and June each.

(c) Creditors allow 2 months credit and debtors are paying one month late. Opening balance of cash Rs. 8,000, lag of one month of expenses.

Solution :

CASH BUDGET

(For the Months from May to July, 1995)

	May	*June*	*July*
	Rs.	*Rs.*	*Rs.*
Receipts :			
Balance b/d	8,000	15,750	12,750
Cash received from debtors	62,000	64,000	58,000
	70,000	79,750	70,750
Payments :			
Cash paid to crditors	36,000	38,000	33,000
Wages	8,000	10,000	8,500
Manufacturing expenses	3,750	4,000	3,750
Office expenses	1,500	2,500	2,000
Selling expenses	5,000	4,500	3,500
Plant (10% on delivery)			1,600
Advance tax		8,000	
	54,250	67,000	52,350
Balance c/d	15,750	12,750	18,400

Problem 10.15. From the following, prepare a cash budget for the months of January to April :–

	Expected Purchases	*Expected Sales*
	Rs.	*Rs.*
January	48,000	60,000
February	80,000	40,000
March	81,000	45,000
April	90,000	40,000

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Wages to be paid to workers Rs. 5,000 each month. Balance at bank on 1st January Rs. 8,000.

It has been decided by the manangement that :

(i) In case deficit of funds within the limit of Rs. 10,000, an arrangement can be made with the bank.

(ii) In case deficit of fund exceeding Rs. 10,000 but within the limit of Rs. 42,000, issue of debentures is to preferred.

(iii) In case deficit of fund exceeding Rs. 42,000, issue of share is preferred (considering the fact it is within the limit of authorised capital).

Solution :

CASH BUDGET

(For the Months from January to April)

	Jan.	*Feb.*	*March*	*April*
	Rs.	*Rs.*	*Rs.*	*Rs.*
Balance b/f	8,000	1,41,000	96,000	55,000
Receipts :				
Cash sales	60,000	40,000	45,000	40,000
Issue of shares	1,26,000			
Cash available	1,94,000	1,81,000	1,41,000	95,000
Payments :				
Purchases	48,000	80,000	81,000	90,000
Wages	5,000	5,000	5,000	5,000
Total Payments	53,000	85,000	86,000	95,000
Balance c/f	1,41,000	96,000	55,000	—

Notes :

Calculation of issue of shares

	Rs.
Total payments during 4 months	3,19,000
Total receipts during 4 months	1,93,000
Total deficiency	1,26,000

Problem 10.16. A new company commences business on 1st July, 1995 and deposits Rs. 10,000 in the bank. This amount will be inadequate to finance its operations over a period of six months and you are asked to prepare a Cash Budget upto 31st Dec. 1995 to determine the monthly overdraft limits to seek from the company's bankers.

The data furnished to you are as thus :

(i) Sales are made to one distributor only on thirty days terms 3% discount and the cheques are received on the first date of the month following the due date.

(ii) Plant purchases totalling Rs. 5,000 are to be made in July.

(iii) All purchases are made on net thirty days terms and cheques paid to creditors on the last day of the month due.

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(iv) Budget figures are :

	July	*August*	*Sept.*	*Oct.*	*Nov.*	*Dec.*
	Rs.	*Rs.*	*Rs.*	*Rs.*	*Rs.*	*Rs.*
Purchases	5,000	4,000	3,000	4,000	4,000	5,000
Wages	4,000	5,000	4,000	4,000	5,000	4,000
Cash Expenses	400	500	400	400	500	400
Sales	6,000	7,000	8,000	9,000	9,000	12,000

Also interpret the results as shown by the preparation of Cash Budget.

Solution :

CASH BUDGET

(From July to December, 1995)

Details	*July*	*Aug.*	*Sept.*	*Oct.*	*Nov.*	*Dec.*
	Rs.	*Rs.*	*Rs.*	*Rs.*	*Rs.*	*Rs.*
Opening Balance	10,000	600	600	600	600	600
Receipts :						
Sales-Debtors			5,820	6,790	7,760	7,760
Total Receipts	10,000	600	6,420	7,390	8,360	8,360
Payments :						
Purchases—						
Creditors	—	5,000	4,000	3,000	4,000	4,000
Wages	4,000	5,000	4,000	4,000	5,000	4,000
Expenses	400	500	400	400	500	400
Plant	5,000	—	—	—	—	—
Total Payments	9,400	10,500	8,400	7,400	9,500	8,400
	+ 600	–9,900	–2,580	–610	–1,740	–640
Overdraft limits for each month	Nil	10,500	2,580	610	1,740	640
Closing Balance	600	600	600	600	600	600

Notes :

1. Overdraft limits for all months except August have been calculated without taking into account the opening balance because the company would like to keep this amount for unforeseen expenses.

2. Amount received from debotrs will be after deducting 3% discount and amount received in September will be for July, in October for August and so on.

Interpretation :

The company is seeking overdrafts in the beginning of its working. There are two reasons for it. One reason is that the company had to spend on plant in the beginning, the second reason is the credit allowed by suppliers. The increase in sale is more than the increase in purchases which is a good sign and will improve cash position of the concern.

Problem 10.17. From the following data, prepar a Cash Budget for the quarter October-December.

(a) Sales :

	Rs.
From the months of August	20,000
September	25,000
October	30,000
November	30,000
December	32,000

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All the sales are on credit. Half of the dues are collected in the month of sale on which a cash discount of 20% is allowed and the other half are realised in the next month.

(b) Materials are purchasd for cash on which a rebate of 5% is offered by the supplier. If the company buys on credit, payment can be deferred by one month foregoing the rebate. The purchases budget for the next quarter is : October Rs. 12,500, November Rs. 15,000 andd December Rs. 18,000.

(c) The direct labour budget is as under :

	Deptt. A	*Deptt. B*
	Rs.	*Rs.*
October	3,000	4,000
November	3,000	4,000
December	3,200	3,800

(d) The manufacturing Overhead budget is as under :

	Deptt. A	*Deptt. B*	*(General Factory)*
	Rs.	*Rs.*	*Rs.*
October	2,400	1,550	800
November	2,400	1,550	800
December	2,500	1,650	900

The above estimates include the quarter's provision for dpreciation amounting to Rs. 900 for Deptt. A and Rs. 750 for Deptt. B.

(e) The general overheads for the quarter is Rs. 3,500 (out of which Rs. 200 is for depreciation reserve, Rs. 300 for bad debts reserve).

(f) An old machine is to be replaced with an additional outlay of Rs. 7,000 in the month of December.

(g) The cash balance on 1st October may be taken Rs. 15,000.

(M. Com. Merrut)

CASH BUDGET

(for the months from October to December)

Receipts :	*October*	*November*	*December*
	Rs.	*Rs.*	*Rs.*
Balance	15,000	15,425	15,975
Collection from debtors	24,500	27,000	27,800
Total receipts	39,500	42,425	43,775
Payments :			
Materials	11,875	14,250	17,100
Direct labour :			
Department A	3,000	3,000	3,200
Department B	4,000	4,000	3,800
Manufacturing Overheads			
Department A	2,100	2,100	2,200
Department B	1,300	1,300	1,400
Factory	800	800	900
General Overheads	1,000	1,000	1,000
Machinery Replacement			7,000
Total Payment	24,075	26,450	36,600
Balance	15,425	15,975	7,175

Problem 10.18. A large retail store makes 25% of its sales for cash and remainder on 30 days' terms. During a recent collection practice, there have been loses

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from bad debts to the extent of 1% of credit sales on an average in the past. The experience of the company tells that normally 60% of credit sales are collected in the month following the sale, 25% in the second following month and 14% in the third following month. sales in the preceding three months of 1996 have been Jan. Rs. 80,000 Feb., Rs. 1,00,000 and March, Rs. 1,40,000. Sales for the next three month are estimated as April, Rs. 1,50,000 May, Rs. 1,10,000 and June, Rs. 1,00,000

Prepare a schedule of the expected cash collections during the month of April, May and June 1996 for presentation to the Finance Department. What will be the cash receipts if the credit policy is enforced strictly so that there are no overdue accounts and bad debts ?

Solution :

STATEMENT OF EXPEXTED CASH RECEIPTS

(for the period of three months ending : June 1996)

Details	*Months*		
	April	*May*	*June*
	Rs.	*Rs.*	*Rs.*
Cash Sales	37,500	27,500	25,000
Cash Collected from debtors :			
January	8,400		
February	18,750	10,500	
March	63,000	26,250	14,700
April		67,500	28,125
May			49,500
Total Cash Receipts	1,27,650	1,31,750	1,17,325

If credit policy is enforced strictly, cash receipts will be as follows :

STATEMENT OF EXPECTED CASH RECEIPTS

Details	*Months*		
	April	*May*	*June*
	Rs.	*Rs.*	*Rs.*
Cash Sales	37,500	27,500	25,000
Cash realised from debtors (75% of prevision month's sales)	1,05,000	1,12,500	82,500
Total Cash Receipts	1,42,500	1,40,000	1,07,500

Problem 10.19. A company expects to have Rs. 25,000 in bank on 1st May 1994 and requires you to prepare an estimate of cash position during the three months-May, June and July, 1994 :

The following information is supplied :

Month	*Sales Rs.*	*Purchases Rs.*	*Wages Rs.*	*Office Expenses Rs.*	*Factory Expenses Rs.*	*Selling Expenses Rs.*
March	50,000	30,000	6,000	4,000	5,000	3,000
April	56,000	32,000	6,500	4,000	5,500	3,000
May	60,000	35,000	7,000	4,000	6,000	3,500
June	80,000	40,000	9,000	4,000	7,500	4,500
July	90,000	40,000	9,500	4,000	8,000	4,500

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Other Information :

(i) 20% of sales are in cash, remaining amount is collected in the month following that of sales.

(ii) Suppliers supply goods at two months credit.

(iii) Wages and all other expenses are paid in the month following the one in which they are inccured.

(iv) The company pays dividends to shareholders, and bouns to workers of Rs. 10,000 and Rs. 15,000 respectively in the month of May.

(v) Plant has been ordered and is expected to be received in June. It will cost Rs. 80,000 to be paid in June.

(vi) Income tax Rs. 25,000 is payable in July.

Solution :

CASH BUDGET

(for the months from May to July 1994)

Details	*May* Rs.	*June* Rs.	*July* Rs.
Receipts :			
Balance b/d	25,000	7,800	–60,700
Cash sales	12,000	16,000	18,000
Cash realised from debtors	44,800	48,000	64,000
Cash Available	81,800	71,800	21,300
Payments :			
Cash payments to Creditors	30,000	32,000	35,000
Wages	6,500	7,000	9,000
Office Expenses	4,000	4,000	4,000
Factory Expenses	5,500	6,000	7,500
Selling Expenses	3,000	3,500	4,500
Payment of Dividend	10,000		
Payment of Bonus	15,000		
Payment of plant		80,000	
Payment of Income-tax			25,000
Total Payments	74,000	1,32,500	85,000
Closing Balance	7,800	–60,700	–63,700
	(81,800	(71,800	(21,300
	–74,000)	–1,32,500)	–85,000)

Problem 10.20. A Glass Manufacturing Company requires you to calculate and present the budget for the next year from the following information ;

Sales :

Thoughened Glass Rs. 3,00,000

Bent thougheened Glass Rs. 5,00,000

Direct Material Cost 60% of sales

Direct Wages 20 workers @ Rs. 150 per month.

Factory Overheads :

Indirect Labour

Works Manager Rs. 500 per month

Foreman Rs. 400 month,

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Stores & Spares $2\frac{1}{2}$ % on sales		
Depreciation on Machinery	12,600	
Light and Power	5,000	
Repairs and Maintenance	8,000	
Other sundries	10% on direct wages	
Administration, selling and distribution expenses	Rs. 14,000 per year,	*(C. A Inter)*

Solution :

MASTER BUDGET

		Sales Budget		*Rs.*
I.	*(i)*	Thoughened Glass		3,00,000
		Bent Thoughened Glass		5,00,000
				8,00,000
	(ii)	*Less :* Administration, selling and distribution expenses		14,000
		Net Sales (Receipts)		7,86,000
II.		*Production Cost Budget*		4,80,000
		Direct materials, 60% of sales		
		Direct wages		36,000
		Prime Cost		5,16,000
		Factory Overheads :		
			Rs.	
		Variable : Stores and spares	20,000	
		($2\frac{1}{2}$ % on sales)		
		Light and power	5,000	
		Repaires and maintenance	8,000	33,000
				5,49,000
		Fixed : Indirect labour :		
		Works Manager	6,000	
		Foreman	4,800	
		Depreciation	12,600	
		Sundries	3,600	27,000
		Works Cost		5,76,000
		Expected Profit (I – II)		2,10,000

Problem 10.21. Bharat Consumer Products employ 10 trucks of 10 tons capacity to deliver products to their distributors. The vehicles remain empty on the return journey. The following data refer to the month of May, 1996 :

	Budget	*Actual*
	Rs.	*Rs.*
Load carried (tons)	4,000	3,800
No. of Truck trips	500	450
Journey hours	3,000	2,500
Loading time (Hours)	1,000	800
Km. travelled	25,000	25,000
Diesal used (litres)	12,500	13,000
Fixed cost	8,000	8,000
Cost per litre of diesel	1.00	0.95

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No. of drivers	12	12
No. of mechanics	5	5
Wages per driver per month	1,000	1,050
Wages per mechanic per month	800	900
Spares for repairs	2,000	2,500

Prepare a statement for management detailing budgeted and actual operating cost. *(I.C.W.A. Final)*

Solution :

Comparative Statement of Operating Costs :

		Budget Rs.	*Actual* Rs.	*Variance* Rs.
(a)	Running and Maintenanc charges :			
	Cost od diesel	12,500 @ Re. 1)	12,350 @ Re. 0.95)	150
	Spares for repairs	2,000	2,500	–500
	Wages of dirvers	12,000	12,600	–600
	Wages of mechanics	4,000	4,500	–500
	Total Running and Maintenance charges	30,500	31,950	–1,450
(b)	Fixed Costs	8,000	8,000	–
(c)	Total Operating Cost	38,500	39,950	–1,450
(d)	Load and distance carried	10,00,00,000 (4,000 × 25,000)	9,50,00,000 (3,800 × 25,000)	50,00,000
(e)	Operating cost per 1,000 ton km. (c) ÷ (d)	0.385	0.421	–0.036
(f)	Operating cost per truck trip	77 (38,500 ÷ 500)	88.78 (39,950 ÷ 450)	–11.78
(g)	Cost of diesel per journey hour	4.17 (12,500 ÷ 3,000)	4,94 (12,350 × 2,500)	–0.77
(h)	Journey hour per trip	6 (3,000 ÷500)	5.56 (2,500 ÷ 450	0.44
(i)	Km. travelled per trip	50 (25,000 ÷ 500)	55.56 (25,000 ÷ 450)	5.56

Problem 10.22. The Board of Directors of Punjab Cable Factory Ltd. have arranged for repayment of loan to a financial institution. You have been asked to prepare a projected profit and loss account for 1996 on the basis of figures available for 1994 and 1995 and to submit the net cash flow. If 75% of the net cash flow is estimated as the fair amount for repayment of loan, ascertain the sum that may be borrowed.

PROFIT AND LOSS ACCOUNT

Debit Side	*1994* Rs.	*1995* Rs.
To Opening stock	80,00,000	1,00,00,000
" Raw materials	3,00,00,000	4,00,00,000
" Stores	1,00,00,000	1,50,00,000
" Manufacutring expenses	1,00,00,000	1,20,00,000
" Other expenses	1,00,00,000	1,30,00,000
" Depreciation	1,00,00,000	1,00,00,000
" Net Profit	1,30,00,000	1,60,00,000
	9,10,00,000	11,60,00,000

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	1994	1995
Credit side		
By Sales	8,00,00,000	10,00,00,000
" Closing stock	1,00,00,000	1,50,00,000
" Misc. income	10,00,000	10,00,000
	9,10,00,000	11,60,00,000

Sales are expected to increase to Rs. 12,00,00,000 alongwith which raw materials stores and manufacturing expenses are expected to rise by the same amount as they rose between 1994 and 1995. Other expenses will increase by Rs. 50,00,000. Depreciation will remain constant. Assume sals and purchase in cash terms and the closing stock is expected to go up by the same amount as between 1994 and 1995. It may be assumed that no dividend is being paid. Ignore income-tax.

Solution :

PROJECTED PROFIT AND LOSS ACCOUNT FOR 1996

	Rs.		*Rs.*
To Open stock	1,50,00,000	By Sales	12,00,00,000
To Raw materials	5,00,00,000	By Closing stock	2,00,00,000
To Stores	2,00,00,000	By Misc. income	10,00,000
To Manufacturing expenses	1,40,00,000		
To Other expenses	1,80,00,000		
To Depreciation	1,00,00,000		
To Net Profit	1,40,00,000		
	14,10,00,000		14,10,00,000

Cash Flow Statement

Net Profit	1,40,00,000
Add : Depreciation	1,00,00,000
	2,40,00,000

75% of net cash flow is to be used for repayment of loan, so Rs. 1,80,00,000 can be raised as loan if it is to be paid within one year.

Problem 10.23. From the following data, calculate :

(a) Activitiy Ratio

(b) Capacity Ratio

(c) Efficiency Ratio

A factory manufactures two products A and B. Standard time to manufacture product A is 2 hours and B 10 hours. The budgeted and actual production in December, 1995 were as follows :

	Budgeted Production	*Actual Production*
Product A	125 Units	10 Units
Product B	30 Units	24 Units

Total actual hours worked were 660.

Solution :

(a) Activity Ratio

$$= \frac{\text{Standard Hours for Actual Production}}{\text{Budgeted Standard Hours}} \times 100$$

(This ratio measures the level of activity attained during the budget).

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Standard Hours for Actual Production :

Product A = 100 Units @ 2 labour hours	= 200 Hours
Product B = 25 units @ 10 labour hours	= 240 Hours
	Total 440 Hours

Budgeted Standard Hours :

Product A = 125 units @ 2 labour hours	= 250 Hours
Product B = 30 units @ 10 labour hours	= 300 Hours
	Total 550 Hours

Activity Ratio

$$= \frac{440}{550} \times 10 = 80\%$$

(b) Capacity Ratio

$$= \frac{\text{Actual Hours worked}}{\text{Budgeted Hours}} \times 100$$

(It indicates the extent to which budgeted hours of activity are actualy utilised.

Capacity Ratio

$$= \frac{660}{550} \times 100 = 120\%$$

(c) Efficiency Ratio

$$= \frac{\text{Standard Hours for Actual Production}}{\text{Actual Hours worked}}$$

(This ratio tells about the efficieny to be attained during the budget period.)

Efficiency Ratio

$$= \frac{440}{660} \times 120 = 66\frac{2}{3}\%$$

Problem10.24. X Ltd., produces and markets three products -Chairs, Tables and Benches. The company is interested in presenting its budget for the next quarter ending 31st March, 1994. It expects to sell 4,200 chairs, 800 tables and 500 benches during the said period at the selling price of Rs. 50, Rs. 85 and Rs. 158 per unit respectively. The following informations are made available for the purpose :–

(i) Material and labour requirements :

	Chairs	*Tables*	*Benches*
Timber per unit (in cu. ft.)	0.5	1.2	2.5
Upholstery per unit (in sq. yds)	0.25	–	–
Carpenter's time (minutes per unit)	45	60	75
Fixer and Finisher's time (minutes per unit)	15	15	30

Timber costs Rs. 50 per cu.ft and upholstery costs Rs. 20 per sq. yd. Fixing and finishing material costs 5% of the cost of timber and upholstery. Carpenter gets Rs. 6 per hour while the fixer and finisher get Rs. 4.80 per hour.

(ii) Inventory levels planned :

	Timber (cu.ft.)	*Upholstery (sq.yds.)*	*Chairs (nos.)*	*Tables (nos.)*	*Benches (nos.)*
Opening	600	400	400	100	50
Closing	650	260	200	300	50

(iii) Fixed overheads would be Rs. 8,000 per month.

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You are requred to :

(a) Prepare a production budget showing quantities to be manufactured.

(b) Prepare a raw materials purchase budget in quantities as well as in rupees.

(c) Draw a direct wage cost budget.

(d) Present a statement showing variable cost of manufacture per unit of all three products.

(e) Find out the budgeted net income for the said quarter.

(C.A. Final Nov. ; 1993)

Solution :

(a) **PRODUCTION BUDGET FOR THE QUARTER ENDING 31ST MARCH, 1994**

	Chairs (Units)	*Tables (Units)*	*Benches (Units)*
Expected Sales	4,200	800	500
Add : Closing Inventory Planned	200	300	50
	4,400	1,100	550
Less : Opening Inventory Planned	400	100	50
Quantity to be manufactured	4,000	1,000	500

(b) **RAW MATERIALS PURCHASE BUDGET**

	Timber	*Upholstery*
Materials required for production (Note 1)	4,450 cft	1,000 sq. yds.
Add : Planned closing inventory	650	260
	5,100	1,260
Less : Planned Opening Inventory	600	400
Quantity to be purchased	4,500	860
Rate per unit	Rs. 50 per cft.	Rs. 20 per sq.yds.
Amount of Purchases (Qty × Rate)	Rs. 2,25,000	Rs. 17,200

(c) **DIRECT WAGE COST BUDGET**

	Mourly Rate (Rs.)	*Labour Hours*	*Cost (Rs.)*
Carpenter (Note 2)	6.00	4,625	27,750
Fixer and Finisher (Note 2)	4.80	1,500	7,200
Total Direct Wage Cost			34,920

(d) **STATEMENT SHOWING VARIABLE COST PER UNIT**

	Chairs (Rs.)	*Tables (Rs.)*	*Benches (Rs.)*
Raw Material			
Timber	25.00 (0.5×50)	60.00 (1.2×50)	125.00 (2.5×50)
Upholstery	5.00 (0.25×20)	–	–
Fixing and Finishing	1.50 $\left[\frac{5}{100} \times (25+5)\right]$	3.00 $\left(\frac{5}{100} \times 60\right)$	6.25 $\left(\frac{5}{100} \times 125\right)$

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Direct Wages			
Carpenter	4.50 $\left(\frac{45}{60} \times 6\right)$	6.00 $\left(\frac{60}{60} \times 6\right)$	7.50 $\left(\frac{75}{60} \times 6\right)$
Fixer and Finisher	1.20 $\left(\frac{15}{60} \times 4.80\right)$	1.20 $\left(\frac{15}{60} \times 4.80\right)$	2.40 $\left(\frac{30}{60} \times 4.80\right)$
Total Variable Cost per unit	37.20	70.20	141.15

(e) STATEMENT OF BUDGETED NET INCOME

	Chairs (Units)	*Tables (Units)*	*Benches (Units)*	*Total*
Budgeted Sales in Units *(a)*	4,200	800	500	
	(Rs.)	*(Rs.)*	*(Rs.)*	*(Rs.)*
Selling Price per unit	50.00	85.00	158.00	
Less : Variable Cost	37.20	70.20	141.15	
Contribution per unit *(b)*	12.80	14.80	16.85	
Total Contribution (a × b)	53,760	11,840	8,425	74,025
Less : Fixed Cost				24,000
Budgeted Net Income				50,025

Working Notes :

1. **Material Required for Production :**

		Chairs	*Tables*	*Benches*	*Total*
(i)	Quantity (units) to be manufactured	4,000	1,000	500	
(ii)	Timber pr unit (cu. ft.)	0.5	1.2	2.5	
(iii)	Timber requird for production *(i×ii)* *(cu. ft.)*	2,000	1,200	1,250	4,450
(iv)	Upholstery per unit (sq. yds)	0.25	–	–	
(v)	Upholstery requird for production (sq. yds) (i x iv)	1,000	–	–	1,000

2. **Labour Hours (Time) Required**

(vi)	Carpentor time per unit (minutes)	45	60	75	
(vii)	Carpenter's time required (ixvi) in Hours	3,000	1,000	625	4,625
(viii)	Fixer and Finisher Time per unit (mts)	15	15	30	
(ix)	Fixer and Finisher Time Required (ixviii)	1,000	250	250	1,500

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11

Responsibility Accounting

Problem 11.1. Nicefit manufactures ready made garments by a simple process of cutting the clothes in various shapes and then sewing the corresponding pieces together to form the finished product.

The Sewing Department and the Cutting Department report to the Production Manager who along with Engineering Manager reports to the Director-manufacturing. The Sales Manager, Publicity Manager and the Credit Manager report to the Director-Marketing who along with Director- manufacturing reports to the Managing Director of the Company.

The Accounts Departments reports the following for the last quarter of 1993:

	Budgeted	*Actual*
Bad Debt Losses	Rs. 5,000	Rs. 3,000
Cloth used	31,000	36,000
Advertising	4,000	4,000
Audit Fees	7,500	7,500
Credit Reports	1,200	1,050
Sales Representative Travelling Expenses	9,000	10,200
Sales Commission	7,000	7,000
Cutting Labour	6,000	6,600
Thread	500	450
Sewing labour	17,000	18,400
Credit Deptt-Salaries	8,000	8,000
Cutting Utilities	800	700
Sewing Utilities	900	950
Director Marketing Salaries & Admn.Exp.	20,000	21,400
Production Engineering Expenses	13,000	12,200
Sales Management Office Expenses	16,000	15,700
Production Manager Office Expenses	18,000	17,000
Direct Mfg. Salaries & Admn. Expenses	21,000	20,100

Using the above data, prepare responsibility accounting reports for the Director-Marketing, the Director- Manufacturing and the Production Manager.

Solution :

RESPONSIBILITY ACCOUNTING REPORT

for the Director Marketing

	Budgeted (Rs.)	*Actual (Rs.)*	*Variance (Rs.)*
(a) Sales Representatives :			
Travelling Expenses	9,000	10,200	1,200 (A)
Sales Commission	7,000	7,000	—
Total (a)	16,000	17,200	1,200 (A)

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(b)	*Sales Management :*			
	Advertising	4,000	4,000	—
	Office Expenses	16,000	15,700	300 (F)
	Total (b)	20,000	19,700	300 (F)
(c)	*Credit Department :*			
	Bad Debt Losses	5,000	3,000	2,000 (F)
	Credit Reports	1,200	1,050	150 (F)
	Salaries	8,000	8,000	—
	Total (c)	14,200	12,050	2,150 (F)
	Total for the three centres (a+b+c)	50,200	48,950	1250(F)

RESPONSIBILITY ACCOUNTING REPORT

for the Production Manager

	Budgeted (Rs.)	*Actual (Rs.)*	*Variance (Rs.)*
(a) *Cutting Department :*			
Cloth used	31,000	36,000	5,000 (F)
Cutting Labour	6,000	6,600	600 (A)
Cutting Utilities	800	700	100 (F)
Total (a)	37,800	43,300	5,500 (A)
(b) *Sewing Department :*			
Thread	500	450	50(A)
Sewing Labour	17,000	18,400	1,400 (A)
Sewing Utilities	900	950	50 (A)
Total (b)	18,400	19,800	1,400 (A)
Total (a+b)	56,200	63,100	6,900(A)

RESPONSIBILITY ACCOUNTING REPORT

for the Director Manufacturing

		Budgeted (Rs.)	*Actual (Rs.)*	*Variance (Rs.)*
(a)	Production Department (As per the Report for the Production Manager)	56,200	63,100	6,900 (A)
(b)	Production Enginering Expenses	13,000	12,200	800 (F)
(c)	Production Manager -Office Exp.	18,000	17,000	1,000 (F)
	Total (a+b+c)	87,200	92,300	5,100 (A)

Problem 11.2. Home Comforts Ltd. deals in three products, Ace, Nice and Grace and these are sold directly through salesmen in three zones, Prime, Extension and Outreach. The responsibility for sales promotion rests with the headquarters and so does the overall control of distribution and sales.

Cost of sales are :

Ace	85 per cent of sales
Nice	80
Grace	75

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Details of sales and selling and distribution expenses for the year are as follows

		Sales	*Selling and distribution expenses allocated direct (Rs.)*
Prime	Ace	9,00,000	63,990
	Nice	9,00,000	84,465
	Grace	4,50,000	47,160
		22,50,000	1,95,615
Extension zone	Ace	6,75,000	46,710
	Nice	4,50,000	47,700
	Grace	2,25,000	23,940
		13,50,000	1,18,350
Outreach zone	Ace	225,000	18,900
	Nice	1,80,000	15,165
	Grace	4,95,000	66,375
		9,00,000	1,00,440

Selling and distribution expenses at headquarters are as follows :

	Rs.
Office expenses	94,500
Advertisement	1,35,000
Other expenses	1,21,500

Advertisement costs are allocated to zones and products on the basis of sales. Office expenses and other expenses are apportioned equally to the zones or the products, while computing the profit or loss for the zones or the products, as the case may be.

Prepare a comparative profit and loss statement, presenting zonal performance as distinct from product performance.

Solution :

COMPARATIVE PROFIT AND LOSS STATEMENT

Particulars	*Prime Zone* (Rs.)	*Extension Zone* (Rs.)	*Outreach Zone* (Rs.)	*Total* (Rs.)
(a) Sales	22,50,000	13,50,000	9,00,000	4,5,00,000
(b) Cost of Sales				
Ace (85 per cent of sales)	7,65,000	5,73,750	1,91,250	15,30,000
Nice (80 per cent of sales)	7,20,000	3,60,000	1,44,000	12,24,000
Grace (75 per cent of sales)	3,37,500	1,68,750	3,71,250	8,77,500
Total Cost of sales (b)	18,22,500	11,02,500	7,06,500	36,31,500
(c) Gross Margin (a–b)	4,27,500	2,47,500	1,93,500	8,68,500
(d) Selling and Distribution ExpensesDirect (allocated)	1,95,615	1,18,350	1,00,440	4,14,405

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Office Expenses (apportioned equally)	31,500	31,500	31,500	94,500
Advertisement (appoirtioned i the ration of sales)	67,500	40,500	27,000	1,35,000
Other Expenses (apportioned equally)	40,500	40,500	40,500	1,21,500
Total Selling and Distribution Expenses (d)	3,35,115	2,30,850	1,99,440	7,65,405
Net Profit (Loss) (c-d)	92,385	16,650	(5,940)	1,03,095

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12

Time Value of Money

SUMMARY OF FORMULAE

S.No.	*Purpose*	*Formula*
1.	Future Value of a current sum of money at period n	$V_n = V_0(1+i)^n$
2.	Future Value of a current sum of money at period n, using Compound Factor Tables	$V_n = V_0(CF_{i,n})$
3.	Doubling Period (Rule of 72)	$D.P. = \frac{72}{\text{Rate of Interest}}$
4.	Doubling Period (Rule of 69)	$D.P. = 0.35 + \frac{69}{\text{Rate of Int.}}$
5.	Future value of money in case of multiple compounding periods.	$V_n = V_0\left(1+\frac{i}{m}\right)^{m\times n}$
6.	Effective rate of interest in case of multi-period compounding	$EIR = \left(1+\frac{i}{m}\right)^m - 1$
7.	Future value of series of payments made at different time periods.	$V_n = R_1(1+i)^{n-1} + R_2(1+i)^{n-2} + \text{---------}(R_{n-1})(1+i) + R_n$
8.	Future value of an annuity	$V_n = (R)(ACF_{i,n})$
9.	Present value of future sums	$V_0 = V_n \times DF_{i,n}$
10.	Present value of an annuity	$V_0 = (R)(ADF_{i,n})$
11.	Present value of an infinite life annuity	$V_0 = \frac{R}{i}$
12.	Annual payment required to accumulate a specified sum of money	$R = \frac{Vn}{ACF_{i,n}}$
13.	Amount of equal instalment to be paid to discharge a specified amount of loan	$R = \frac{V_0}{ADF_{i,n}}$
14.	Calculation of compound rate of growth	$V_n = V_0(CF_{i,n})$

Problem 12.1. Calculate the future value of Rs. 20,000 invested now for a period of 5 years at a time preference rate of 8%.

Solution :

$V_n = V_0(1+i)^n$

$V_5 = 20,000\ (1+0.08)^5$

$= 20,000\ (1.08)^5$

$=$ Rs. 29, 380

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Alternatively, Using Compound Factor Tables,

$V_n = V_0 (CF_{i,n})$

$= 20,000 (1.469)$

$=$ Rs. 29,380.

Problem 12.2 Determine the future value at the end of 5 years of the following series of payments at 5% rate of interest :

At the end of 1st year = Rs. 1,000
2nd year = Rs. 2,000
3rd year = Rs. 3,000
4th year = Rs. 4,000
5th year = Rs. 5,000

Solution :

$V_n = R_1 (1+i)^{n-1} + R_2 (1+i)^{n-2} + \text{----------} (R_{n-1}) (1+i)^n + R_n$

$V^5 = 1000 (1.05)^4 + 2000 (1.05)^3 + 3000 (1.05)^2 + 4000(1.05) + 5000$

$=$ Rs. 1216 + 2316 + 3309 + 4200 + 5000

$=$ Rs. 16,041

IT CAN ALSO BE CALCULATED AS GIVEN IN THE FOLLOWING TABLE

End of year	*Amount of Payment*	*Number of Years Compounded*	*Compound Factor*	*Future Value*
1	*2*	*3*	*4*	*5=2×4*
1	1,000	4	1.216	1,216
2	2,000	3	1.158	2,316
3	3,000	2	1.103	3,309
4	4,000	1	1.050	4,200
5	5,000	0	1.000	5,000
			Future value at the end of 5 years	16,041

Problem 12.3. Mr. X deposits Rs. 5,000 at the end of every year for 5 years and the deposit earns a compound interest @ 8% p.a. Determine how much money he will have at the end of 5 years.

Solution :

$V_n = (R) (ACF_{i,n})$

Using Compound Factor Tables,

$V_5 = 5000 (5.867)$

$=$ Rs. 29, 335.

Problem 12.4 . Calculate the present value of Rs. 10,000 to be received after 5 years from now assuming 6% time preference for money.

Solution :

$V_0 = V_n \times DF_{i,n}$

$V_n =$ Rs. 10,000 (given)

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$DF_{i,n} = 0.747$ (Consulting discount factor tables, the discount factor at 6% for 5 years)

Substituting the values

$V_0 = 10,000 \times 0.747$

$= Rs. 7470.$

Problem 12.5 Calculate the present value of the following cash flows assuming a discount rate of 8%

Year	Cash Flows
1.	Rs. 10,000
2.	Rs. 20,000
3.	Rs. 10,000
4.	Rs. 5,000

Solution:

CALCULATION OF PRESENT VALUE

Year (1)	*Cash Flows* (2)	*P.V.Factor (at 8%)* (3)	*P.V. of Cash Flows* (4=2×3)
1	Rs.10,000	.926	Rs.9,260
2	20,000	.857	17,140
3	10,000	.794	7,940
4	5,000	.735	3,675
	Total Present Value of Cash Flows		Rs.38,015

Problem 12.6. Mr. A has to receive Rs. 5,000 per year for 6 years. Calculate the present value of the annuity assuming that he can earn interest on his investment at 12% p.a.

Solution :

$V_0 = (R)\ (ADF_{i,n})$

In the given problem, R = Rs. 5000

From the Annuity Discount Tables, we find that the annuity discount factor at (i), 12 per cent and n, 6 years is 4.111.

$\therefore$ Present Value $(V_0) = 500 \times 4.111$

$= Rs. 20,555$

Problem 12.7. A company needs Rs. 10,00,000 after 5 years from now for replacement of its fixed assets. It has established a Sinking Fund for the purpose. The investments are to be made at the end of each year. What annual payment must be made to ensure the needed Rs. 10,00,000 after 5 years. Assume 10% interest per year on investments.

Solution :

$$R = \frac{V_n}{ACF_{i,n}}$$

Referring to the Annuity Compound Factor Tables, we find that at (i) 10 percent and n=5 years, the compound value of an annuity of Rs. 1 is 6.105

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$$\therefore R = \frac{10,00,000}{6.105}$$

$$= \text{Rs. } 1,63,800.16$$

Problem 12.8. Determine the amount of equal annual payment to be made for a loan of Rs. 2,00,000 taken for a period of 4 years at 10% rate of interest.

Solution :

$$R = \frac{V_0}{ADF_{i,n}}$$

Referring to the Annuity Discount Factor Tables at (i), 10 per cent and n,4 years, we get 3.170

$$\therefore R = \frac{2,00,000}{3.170}$$

$$= \text{Rs. } 63,091.48.$$

Problem 12.9 If you deposit Rs. 10,000 today at 12 per cent rate of interest, in how many years with this amount grow to Rs. 80,000 ? Work out this problem by using the Rule of 72. Do not use the Compound Factor Tables.

Solution :

According to Rule of 72,

$$\text{Doubling Period} = \frac{72}{\text{Rate of Interest}}$$

$$= \frac{72}{12} = 6 \text{ years.}$$

Hence, Rs. 10,000 will double to Rs. 20,000 in the first 6 years; Rs. 20,000 will double to Rs. 40,000 in the next 6 years; and Rs. 40,000 will double to Rs. 80,000 in the next 6 years.

We can conclude that Rs. 10,000 will grow to Rs. 80,000 in 6+6+6; i.e. 18 years.

Problem 12.10. Mr. Ramesh purchased 100 shares of a company for Rs. 10 each on 1-1-1981. The market value per share on 31.12.1995 is Rs. 47.85. What is the compound rate of growth in the value of the shares ?

Solution :

$V_n = V_0 (CF_{i,n})$

Where $CF_{i,n}$ is compound factor at (i) percent and (n) period

Or, $47.85 = 10 (CF_{i,n})$

$$\text{Or, } CF_{i,n} = \frac{47.85}{10}$$

$$= 4.785$$

Using Compound Factor Tables for 15 years row we find that the value 4.785 is at 11%. Hence the compound rate of growth is 11%.

Problem 12.11 An investment company pays 12 per cent rate of interest and compounds it quarterly. If Rs. 5000 are deposited initially, how much shall it grow to in 5 years.

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Solution :

$$V_n = V_0 \left(1+\frac{i}{m}\right)^{m\times n}$$

$$= 5000 \left(1+\frac{.12}{4}\right)^{4\times 5}$$

$$= 5000\ (1.03)^{20}$$

$$= \text{Rs. } 9030.$$

Alternatively, we can use Compound Factor Tablcs. The value of Rs. 1 compounded at 3% (12÷4) rate of interest for 20 years (4×5) is Rs. 1.806. Thus, the value of Rs. 5,000 shall be : Rs. 5,000 ×1.806 = Rs. 9030.

Problem 12.12 A company offers to pay you Rs. 5,002 annually for 6 years if you deposit Rs. 20,000 today with the company. What interest rate do you earn on the deposit.

Solution :

Using Present Value Annuity Tables

$V_0 = (R)\ (ADF_{i.n})$

Or, $20,000 = 5,002\ (ADF_{i.n})$

$$\text{Or, } ADF_{i,n} = \frac{20,000}{5,002}$$

$$= 3.998$$

From the Annuity Discount Tables, We find that for annuity discount factor 3.998 for a period of 6 years, the rate of interest is 13%.

Hence, the rate of interest earned on deposit is 13% p.a.

Problem 12.13. An investment company offers to pay Rs. 60,965 at the end of 15 years to investors who deposit annually Rs. 1000. What interest rate is implict in the offer.

Solution :

$$V_0 = (R)\ (ADF_{i,n})$$

$$60,965 = 1000\ (ADF_{i,n})$$

$$\text{Or, } ADF_{i,n} = \frac{60,965}{1,000}$$

$$= 60.965$$

From the Annuity Discount Tables, we find that for annuity discount factor 60.965 for a period of 15 years, the rate of interest is 18%.

Hence, the rate of interest implied in the offer is 18% p.a.

Problem 12.14. If you deposit Rs. 20,000 today at 12 per cent rate of interest, in how many years will this amount grow to Rs. 80,000. Work out this problem by using Rule of 72. Do not use the compound Factor Tables.

Solution :

According to Rule of 72,

$$\text{Doubling Period} = \frac{72}{\text{Rate of Interest}}$$

$$= \frac{72}{12} = 6 \text{ years}$$

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Therefore, Rs. 20,000 will double to Rs. 40,000 in first 6 years and further Rs. 40,000 will double to Rs. 80,000 in another 6 years. We can say that Rs. 20,000 will grow to Rs. 80,000 in 12 years at 12 percent p.a.

Problem 12.15. Mr. A offers to pay you Rs. 12,000 after 15 years in exchange of Rs. 1000 today. What interest rate is implicit in the offer.

Solution :

$$V_n = V_0 (CF_{i,n})$$

$$\text{Or } CF_{i,n} = \frac{V_n}{V_0}$$

$$= \frac{12,000}{1000}$$

$$= 12$$

Using compound Factor Tables for 15 years row we find that the nearest value to 12 is 11.974 at 18%. Hence, the interest rate implied in the offer is 18% p.a.

Problem 12.16. Mr. Rakesh receives a sum of Rs.2,00,000 as provident fund on his retirement. He deposits it in a bank which pays 12 per cent interest. if he withdraws annually Rs. 29,364, how long can he do so ?

Solution :

Using Present Value Annuity Tables,

$$V_0 = (R)\ (ADF_{i,n})$$

$$\text{Or, } 2,00,000 = 29,364\ (ADF_{i,n})$$

$$\text{Or, } ADF_{i,n} = \frac{2,00,000}{29364} = 6.81$$

From the annuity discount factor tables, we find that for annuity discount factor 6.81 at an interest rate of 12 per cent, the period is 15 years.

Hence, he can withdraw annually, Rs. 29,364 for a period of 15 years.

Problem 12.17. At the time of his retirement Mr. X is given a choice between two alternatives ; *(i)* an annual pension of Rs 10,000 as long as he lives, and *(ii)* a lump sum payment of Rs. 60,000. If Mr. X expects to live for 15 years and rate of interest is 15 per cent, which alternative should he select ?

Solution :

(i) Present Value of Rs. 10,000 received annually for 15 years at 15 per cent per annum rate of interest :

$V_0 = (R)\ (ADF_{i,n})$

R = Rs. 10,000 (given)

$ADF_{i,n}$ =5.847 (from annuity discount factor tables)

$\therefore$ Present Value $(V_0) = 10,000 \times 5.847$

= Rs. 58, 470.

(ii) Present value of lump sum payment of Rs. 60,000 is Rs. 60,000.

As, the present value of Rs. 10,000 received annually for 15 years at 15% rate of interest (Rs. 58, 470) is less than the present value of lump sum (Rs. 60,000); Mr. X should select to receive the lump sum.

Problem 12.18. Mr. Rajan is to receive Rs. 5,000 after five years from now. His time preference for money is 10% p.a. Calculate its present value, if the discount factor is 0.621.

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Solution :

Present Value $(V_0) = V_n \times DF_{i,n}$

$= 5000 \times 0.621$

$=$ Rs. 3105

Problem 12.19. A 10, payment annuity of Rs. 5,000 will begin 7 years hence. What is the value of this annuity now if the discount rate is 12% ?

Solution :

The first payment shall be received at the end of 7 years, and the last payment at the end of 16 years to make 10 payments in all. This can be shown as :

Year 0——————7——————16

First Payment Last Payment

The present value discount factor for an annuity of 16 years at 12% is 6.974. But as no payment will be received for 6 years, we subtract the present value discount factor for 6 years, viz; 4.111. Thus, the relevent present value factor of the annuity is :

PVAF = 6.974-4.111

= 2.863.

Now, we can calculate the present value of the annual payment of Rs. 5000 for 10 years beginning 7 years hence at 12% as below :

$P_0 = 5000 \times 2.863$

= Rs. 14,315.

Problem 12.20. A person invests Rs. 5,000 at the end of each year at 10% rate of interest per year. State what amount he will receive at the end of 4 years.

Solution :

$V_n = (R)\ (ACF_{i,n})$

$= 5000 \times 4.641$

= Rs. 23,205

Problem 12.21. Mr. X is to receive from Indira Vikas Patra Rs. 20,000 after 5 years from now. His time preference for money is 10% p.a. Calculate its present value if the discount factor is 0.621.

Solution :

$V_0 = V_n \times DF_{i,n}$

$= 20{,}000 \times 0.621$

=Rs. 12,420.

Problem 12.22. X deposits Rs. 1,00,000 on retirement in a bank which pays 10% annual interest. How much can he withdraw annually for a period of ten years if PV g FA 10% is 6.145 ?

Solution :

$V_0 = (R)\ (ADF_{i,n})$

$$\text{Or } R = \frac{V_0}{ADF_{i,n}}$$

$$= \frac{V_0}{PV_g\,FA}$$

$$= \frac{1{,}00{,}000}{6.145}$$

= Rs. 16,273.39

Hence, he will withdraw annually Rs. 16,273.39 for ten years.

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13

Valuation–Concepts and Models

(Valuation of Securities)

Problem 13.1. An investor is considering the purchase of a 12% Rs. 1000 debenture redeemable after 5 years at par. The investor's required rate of return is 14%. What should he be willing to pay now to purchase the debenture ?

Solution :

$$V_d = (R)\,(ADF_{i,n}) + (M)\,(DF_{i,n})$$
$$= 120\,(3.433) + 1000\,(.519)$$
$$= 411.96 + 519$$
$$= \text{Rs. } 930.96$$

Problem 13.2. Mr. X has a perpetual bond of the face value of Rs. 1,000. He receives an interest of Rs. 90 annually. What would be its value if the required rate of return is 15%

Solution :

$$V_d = \frac{R}{K_d}$$
$$= \frac{90}{.15}$$
$$= \text{Rs. } 600.$$

Problem 13.3. Face value of a 15% debenture is Rs. 1,000. The maturity period of the debenture is 5 years. What is the value of the debenture if the required rate of return is ; *(a)* 15% and *(b)* 12%.

Solution :

$$V_d = (R)\,(ADF_{i,n}) + (M)\,(DF_{i,n})$$

(a) $V_d = 150\,(3.352) + 1000\,(.497)$
$= 502.8 + 497$
$= \text{Rs. } 999.80$, or say Rs. 1,000.

(b) $V_d = 150\,(3.605) + 1000\,(.567)$
$= 540.75 + 567$
$= \text{Rs. } 1107.75$, or say Rs. 1108.

Problem 13.4. An investor holds a debenture of Rs. 1,000 carrying a coupon rate of 10% p.a. The interest is payable semi-annually. The maturity period of the debenture is 7 years and it is to be redeemed at a premium of 10%. The investor's required rate of return is 12% p.a. Calculate the value of the debenture.

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Solution :

$$V_d = \left(\frac{R}{2}\right)(ADF_{i/2,2n}) + (M)(DF_{i/2,2n})$$

$$= \frac{100}{2}(9.295) + 1100\ (.442)$$

$$= 464.75 + 486.20$$

$$= \text{Rs. } 950.95.$$

Problem 13.5. Mr. X has a perpetual bond of the face value of Rs. 1,000. He receives an interest of Rs. 80 annually. Its current value is Rs. 1200. What is the yield to maturity ?

Solution :

$$V_d = \frac{R}{K_d}$$

$$\text{Or } K_d = \frac{R}{V_d}$$

$$= \frac{80}{1200}$$

$$= 0.0666$$

Thus, the yield to maturity is 6.667%

Problem 13.6. Mr. A is considering the purchase of a 10% preference share of Rs. 100 redeemable after 5 years at par. What would he be willing to pay now to purchase the share if his required rate of return is 12% ?

Solution :

$$V_p = (R)(ADF_{i,n}) + (M)(DF_{i,n})$$
$$= 10\ (3.605) + 100\ (.567)$$
$$= 36.05 + 56.70$$
$$= \text{Rs. } 92.75.$$

Problem 13.7. Mr. X has a redeemable preference share of Rs. 1,000. He receives an annual dividend of Rs. 120 annually. What will be its value if the required rate of return is 15%.

Solution :

$$V_p = \frac{d}{K_p}$$

$$= \frac{120}{.15}$$

$$= \text{Rs. } 800.$$

Problem 13.8. Mr. A is planning to buy an equity share, hold it for one year then sell it. The expected dividend at the end of year 1 is Rs. 8 and the sale proceeds Rs. 160 after 1 year. Determine the value of the share to the investor assuming the discount rate of 12%.

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Solution :

$$P_0 = \frac{D_1}{(1 + K_e)} + \frac{P}{(1 + K_e)}$$

$$= \frac{8}{1.12} + \frac{160}{1.12}$$

$$= \frac{168}{1.12}$$

$$= \text{Rs. } 150.$$

Problem 13.9. Mr. X is planning to buy an equity share, hold it for 2 years and then sell it. The expected dividend at the end of year 1 is Rs. 8 and Rs. 9 at the end of year 2. The expected selling price of the share at the end of year 2 is Rs. 180. Calculate the value of the share today taking 10% discount rate.

Solution :

$$P_0 = \frac{D_1}{(1 + K_e)} + \frac{D_2}{(1 + K_e)^2} + \frac{P_2}{(1 + K_e)^2}$$

$$= \frac{8}{1.10} + \frac{9}{(1.10)^2} + \frac{180}{(1.10)^2}$$

$$= \frac{8}{1.10} + \frac{9}{1.21} + \frac{180}{1.21}$$

$$= 7.272 + 7.438 + 148.760$$

$$= \text{Rs. } 163.470, \text{ or say Rs. } 163.50.$$

Problem 13.10. An investor expects a dividend of Rs. 8 per share for each of 5 years and selling price of Rs. 120 at the end of 5 years. Calculate the present value of share if his required rate of return is 10%.

Solution :

$$P_0 = (D)\,(ADF_{i,n}) + (P_n)\,(DF_{i,n})$$

$$= \text{Rs. } 8\,(ADF_{10.5}) + 120\,(DF_{10.5})$$

$$= \text{Rs. } 8\,(3.791) + 120\,(.621)$$

$$= \text{Rs. } 30.328 + 74.520$$

$$= \text{Rs. } 104.848.$$

Problem 13.11. A company is presently paying a dividend of Rs. 9 per share and is expected not to deviate from this in future. Calculate the value of the share if the required rate of return is 15%.

Solution :

$$P_0 = \frac{D}{K_e}$$

$$= \frac{9}{.15}$$

$$= \text{Rs. } 60.$$

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Problem 13.12. A company is presently paying a dividend of Rs. 8 per share. The dividends are expected to grow perpetually at a rate of 10%. What is the value of its share if the required rate of return is 15%.

Solution :

$$P_0 = \frac{D_1}{K_e - g}$$

$$= \frac{8}{.15 - .10}$$

$$= \frac{8}{.05}$$

$$= \text{Rs. } 160.$$

Problem 13.13. Calculate the price of an equity share of a company whose earnings per share are Rs. 15, if the equity capitalisation rate is 10%.

Solution :

$$P_0 = \frac{E_0}{K_e}$$

$$= \frac{15}{.10}$$

$$= \text{Rs.}150.$$

Problem 13.14. A company is expected to pay a dividend of Rs. 2 per equity share. The dividends are expected to grow perpetually at a growth rate of 10%. Find out the share price today, if the market capitalises dividend at 30%.

Solution :

$$P_0 = \frac{D_1}{K_e - g}$$

$$= \frac{2}{.30 - .10}$$

$$= \frac{2}{.20}$$

$$= \text{Rs. } 10$$

Problem 13.15. HKN Ltd. is expected to pay a dividend of Rs. 2 a year hence. The company's dividend is expected to grow at the rate of 6% per annum. Calculate the price of equity share today, if required rate of return for this share is 14%.

Solution :

$$P_0 = \frac{D_1}{K_e - g}$$

$$= \frac{2}{.14 - .06}$$

$$= \frac{2}{.08}$$

$$= \text{Rs. } 25$$

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Problem 13.16. Investors require a 12% rate of return on equity shares of a Co. What would be the market price of the shares if the previous dividend was Rs. 2 and the investors expect dividends to grow at a constant rate of 11%.

Solution :

$$P_0 = \frac{D_1}{K_e - g}$$

$$= \frac{2}{.12 - .11}$$

$$= \frac{2}{.01}$$

$$= \text{Rs. } 200.$$

Problem 13.17. A company is currently paying a dividend of Rs. 6 per share and it is expected not to be deviate from this in future. If the capitalisation rate is 12 percent, calculate the price of share today.

Solution :

$$P_0 = \frac{D}{K_e}$$

$$= \frac{6}{.12}$$

$$= \text{Rs. } 50.$$

Problem 13.18. The Board of Management of Herbertson Tissues Ltd. will pay a dividend of Rs. 3 per Equity Share after a year. Share is currently selling at Rs. 50 and it is estimated that after a year the price will be Rs. 53.

(a) What is the present value of the Equity Share, if the required rate of return is 10% ?

(b) Calculate the return on share, if it is bought and sold after a year.

Solution :

(a) $$P_0 = \frac{D_1 + P_1}{1 + K_e}$$

$$= \frac{3 + 53}{1 + .10}$$

$$= \frac{56}{1.10}$$

$$= \text{Rs. } 50.90$$

(b) $$r_e = \frac{D_1}{P_0} + \frac{P_1 - P_0}{P_0}$$

$$= \frac{3}{50} + \frac{53 - 50}{50}$$

$$= \frac{3}{50} + \frac{3}{50}$$

$$= \frac{6}{50}$$

$$= 0.12 \text{ or say } 12 \text{ per cent.}$$

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Problem 13.19. A company proposes to issue ten year debentures of Rs. 10,000 (Rs. 100 per value). The company would return Rs. 1,000 at the end of every year and will pay interest annually at 10% on the outstanding amount. Determine the present value of the debenture issue, if capitalisation rate is 20%.

Present value factors at 20% are given below :–

Year	*Present Value Factor at 20%*
1	0.833
2	0.694
3	0.579
4	0.482
5	0.402
6	0.335
7	0.279
8	0.233
9	0.194
10	0.162

Solution :

CALCULATION OF PRESENT VALUE OF DEBENTURE

Year 1	*Interest* 2 (Rs.)	*Repayment* 3 (Rs.)	*Total Cash Flow* 4 = (2 + 3) (Rs.)	*P.V. Factor* 5	*Present Value* 6 = (4 × 5) (Rs.)
1	1,000	1,000	2,000	0.833	1,666.00
2	900	1,000	1,900	0.694	1,318.60
3	800	1,000	1,800	0.579	1,042.20
4	700	1,000	1,700	0.482	819.40
5	600	1,000	1,600	0.402	643.20
6	500	1,000	1,500	0.335	502.50
7	400	1,000	1,400	0.279	390.60
8	300	1,000	1,300	0.233	302.90
9	200	1,000	1,200	0.194	232.80
10	100	1,000	1,100	0.162	178.20
			Present Value of Debenture		7096.40

Problem 13.20. A company is expected to pay a dividend of Rs. 4 per equity share now. Its dividends re expected to grow at 15% for the next 5 years and then at the rate of 10% indefinitely. Find out the present value of its equity share, if the capitalisation rate is 12%.

Following are the present value factors at 12% per annum :

Year	*PV Factor at 12%*	*Year*	*PV Factor at 12%*
1	0.893	4	0.636
2	0.797	5	0.567
3	0.712	6	0.507

Solution :

(i) Present Value of the Share during Super-normal Growth Period :

$$P_0 = \sum_{t=1}^{n} \frac{D_1}{(1 + K_e)^t}$$

$$= \frac{4\,(1.15)}{1.12} + \frac{4\,(1.15)^2}{1.12} + \frac{4\,(1.15)^3}{1.12} + \frac{4\,(1.15)^4}{1.12} + \frac{4\,(1.15)^5}{1.12}$$

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$$= 4.11 + 4.72 + 5.43 + 6.25 + 7.19$$

$$= \text{Rs. } 27.70.$$

(ii) Present Value of the share at the end of 5 years applying constant growth rate of 10%. :

$$P_0 = \frac{D_6}{K_e - g_n} = \frac{D_5 (1 + g_n)}{K_e - g_n}$$

$$= \frac{4 (1.15)^5 (1.10)}{0.12 - 0.10}$$

$$= \frac{8.85}{0.02}$$

$$= \text{Rs. } 442.50$$

The discounted value of 442.50 is :

$$= \frac{442.50}{(1.12)^5}$$

$$= \text{Rs. } 251.08$$

(iii) The present value of the share :

$$P_0 = \text{Rs. } 27.70 + 251.08$$

$$= \text{Rs. } 278.78$$

Problem 13.21. A company is currently paying a dividend of Rs. 2 per share. The dividend is expected to grow at 15% for three years, then at 10% for the next three years, after which it is expected to grow at 5% forever.

What is the present value of the share if the capitalisation rate is 10% ?

Year	*PV Factor at 10%*
1	0.909
2	0.826
3	0.751
4	0.683
5	0.621
6	0.565

Solution :

(i) **Present Value of the Share During Super Normal Growth Period**

Year	*Dividend*	*P.V. Factor at 10%*	*Present Value*
	(Rs.)		*(Rs.)*
1	$2.00 (1.15)^1 = 2.30$	0.909	2.09
2	$2.00 (1.15)^2 = 2.64$	0.826	2.18
3	$2.00 (1.15)^3 = 3.04$	0.751	2.28
4	$3.04 (1.10)^1 = 3.35$	0.683	2.29
5	$3.04 (1.10)^2 = 3.68$	0.621	2.29
6	$3.04 (1.10)^3 = 4.05$	0.565	2.29
	Total		13.42

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(ii) Present value of share at the end of year 7, applying constant growth rate of 5%.

$$P_0 = \frac{D_7}{K_e - g} = \frac{D_6 (1 + g_n)}{K_e - g_n}$$

$$= \frac{4.05 (1 + .05)}{0.10 - 0.5}$$

$$= \frac{4.05 (1.05)}{0.05}$$

$$= \text{Rs. } 85.05$$

(iii) Present value of share today = Rs. 13.42 + 85.05
= Rs. 98.47

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14

Capital Structure

Problem 14.1. The Hardware Company Ltd. has to make a choice between debt issue and equity issue for its expansion programme. Its current position is as follows :

	Rs.
Debt 5%	20,000
Equity Capital (Rs. 10 per share)	50,000
Surpluses	30,000
Total Capitalisation	1,00,000
Sales	3,00,000
Total Costs	2,69,000
Income before Interest & taxes	31,000
Interest	1,000
	30,000
Income-tax 50%	–15,000
Income after taxes	15,000

The expansion programme is estimated to cost Rs. 50,000. If this is financed through debt, the rate on new debt will be 7% and the price-earning ratio will be 6 times. If the expansion programme is financed through equity, new shares can be sold netting Rs. 25 per share, and the price earning ratio will be 7 times. The expansion will generate additional sales of Rs. 1,50,000 with a return of 10% on sales before interest and taxes. If the company is to follow a policy of maximising the market value of its shares, which form of financing should it choose ? *(M. Com. Delhi)*

Solution :

CALCULATION OF MARKET VALUE OF SHARE

	Alternatives	
	7% Debt Issue	*Equity Issue*
	Rs.	*Rs.*
Earnings before Interest and tax (EBIT)	46,000	46,000
Less : Interest	4,500	1,000
	41,500	45,000
Less : Income tax @ 50%	20,750	22,500
Earnings After tax	20,750	22,500
Earnings per share (EPS)	$\frac{20,750}{5,000} = 4.15$	$\frac{22,500}{7,000} = 3.21$
Price-Earning Ratio	6 times	7 times
Market Value of share (EPS × P/E ratio)	4.15 × 6 = Rs. 24.90	3.21×7=Rs. 22.50

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On the basis of market value of its shares, the company should choose debt form of financing ; as market value of its shares shall be Rs. 24.90 which is more than Rs. 22.50 if the market value of equity issue is chosen.

Working Notes :

		Rs.
(i)	Earnings before interest & tax	
	Present EBIT	31,000
	Add : Expected EBIT from new investment (10% of 1,50,000)	15,000
		46,000
(ii)	Calculation of Interest :	
(a)	Debt Issue	
	5% Interest on 20,000	1,000
	and 7% on 50,000	3,500
	Total Interest	4,500
(b)	Equity Issue :	
	5% Interest on 20,000	1,000

(iii) In debt financing, the number of equity shares remains 5,000 while in equity financing it will increase by 2,000 *i.e.*, 50,000 ÷ 25.

Problem 14.2. ABC company has currently an ordinary share capital of Rs. 25 lakhs, consisting of 2,500 shares of Rs. 100 each. The management is planning to raise another Rs. 20 lakhs to finance a major programme of expansion through one of four possible financial plans. The options are :

(i) Entirely through ordinary shares.

(ii) Rs. 10 lakhs through ordinary shares and Rs. 10 lakhs through long-term borrowings at 8% interest per annum.

(iii) Rs. 5 lakhs through ordinary shares and Rs. 15 lakhs through long-term borrowing at 9% interest per annum.

(iv) Rs. 10 lakhs through ordinary shares and Rs. 10 lakhs through preference shares with 5% dividend.

The company's expected earnings before interest and taxes (EBIT) will be Rs. 8 lakhs. Assuming a corporate tax rate of 50%, determine the earnings per share in each alternative and comment which alternative is the best and why ?

(Adapted I.C.W.A., Final)

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Solution :

CALCULATION OF EARNINGS PER SHARE

	Plan I Rs. 20 lakhs Ordinary Shares Rs. in lacs	*Plan II* Rs. 10 lakhs Ordinary Shares and 10 lakhs 8% long term loan Rs. in lacs	*Plan III* Rs. 5 lakhs Ordinary Shares and Rs. 15 lakhs 9% loan Rs. in lacs.	*Plan IV* Rs. 10 lakhs Ordinary Shares and Rs. 10 lakhs 5% Pref. Shares Rs. in lacs.
Expected earnings before interest and Tax (EBIT)	8.00	8.00	8.00	8.00
Less : interest	—	0.80	1.35	—
Earnings after Interest before tax	8.00	7.20	6.65	8.00
Less : Tax @ 50%	4.00	3.60	3.33	4.00
Earnings after tax	4.00	3.60	3.32	4.00
Less : Preference Dividend	—	—	—	0.50
Earnings available for ordinary Shareholders	4.00	3.60	3.32	3.50
No. of Ordinary Shares	45,000	35,000	30,000	35,000
Earnings per Share (EPS)	4.00,000	3,60,000	3,32,000	3,50,000
	45,000	35,000	30,000	35,000
	=8.88	=10.29	=11.07	=10.00

Plan III which gives the highest earnings per share is the best and hence the company should raise Rs. 5 lakhs through ordinary shares and Rs. 15 lakhs through long term borrowings at 9% interest per annum. It will increase dividend per share and the market value of the shares.

Problem 14.3. XY Ltd. needs Rs. 50,00,000 for the installation of a new factory. The new factory is expected to yield annual Earnings Before Interest and Tax (EBIT) of Rs. 10,00,000. In choosing a financial Plan, XY Ltd. has an objective of maximising earnings per share. It is considering the possibilities of issuing ordinary shares and raising debt of Rs. 5,00,000 or Rs. 20,00,000 or Rs. 30,00,000. The current market price per share is Rs. 300 and is expected to drop to Rs. 250 if the funds are borrowed in excess of Rs. 20,00,000. Funds can be raised at the following rates :

Upto Rs. 5,00,000 at 10%

Over Rs. 5,00,000 to Rs. 20,00,000 at 15%

Over Rs. 20,00,000 at 20%

Assuming a tax rate of 50%, advise the company.

Solution :

	Alternatives		
	I (Rs. 5,00,000 debt)	*II* (Rs. 20,00,000 debt)	*III* (Rs. 30,00,000 debt)
	Rs.	*Rs.*	*Rs.*
Earnings Before Interest & Tax (EBIT)	10,00,000	10,00,000	10,00,000
Less : Interest	50,000	2,75,000	4,75,000
Earnings Before Tax	9,50,000	7,25,000	5,25,000

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Less : Tax @ 50%	4,75,000	3,62,500	2,62,500
	4,75,000	3,62,500	2,62,500
No. of Shares	45,00,000	30,00,000	20,00,000
	300	300	250
	= 15,000	= 10,000	= 8,000
Earnings Per Share (EPS)	4,75,000	3,62,500	2,62,500
	15,000	10,000	8,000
	= 31.667	= 36.25	= 32.81

The second alternative which gives the highest Earnings per share is the best. Hence, the company is advised to raise Rs. 20,00,000 through debt and Rs. 30,00,000 by ordinary shares.

Problem 14.4. Companies X and Y are identical in all respects including risk factors except for debt/equity, X having issued 10% debentures of Rs. 18 lakhs while Y has issued only equity. Both the companies earn 20% before interest and taxes on their total assets of Rs. 30 lakhs.

Assuming a tax rate of 50% and capitalisation rate of 15% for an all-equity company, compute the value of companies X and Y using *(i)* net income approach and *(ii)* net operating income approach.

Solution :

(i) Net Income Approach

	Company X (Rs.)	*Company Y (Rs.)*
Earnings Before Interest and Taxes (EBTI) @ 20% on Rs. 30,00,000	6,00,000	6,00,000
Less : Interest on Debentures	1,80,000	—
	4,20,000	6,00,000
Less : Tax @ 50%	2,10,000	3,00,000
Earnings available for equity shareholders	2,10,000	3,00,000
Capitalised value of Equity at 15%		
Company X : $2,10,000 \times \frac{100}{15}$	14,00,000	
Y : $3,00,000 \times \frac{100}{15}$		20,00,000
Add : Value of Debt	18,00,000	—
Total Value of Company	32,00,000	20,00,000

(ii) Net Operating Income Approach

Value of Unlevered Company Y, (V_u) $= \frac{EBIT\,(1 - t)}{K_e}$

$= \frac{6,00,000\,(1 - 0.5)}{.15}$

$= Rs.\ 20,00,000$

Value of Levered Company X, (V_L) $= V_u + td$

$= 20,00,000 + .5 \times 18,00,000$

$= 20,00,000 + 9,00,000$

$= Rs.\ 29,00,000.$

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Problem 14.5. The following is the data regarding two Companies 'X' and 'Y' belonging to the same equivalent risk class :

	Company X	*Company Y*
Number of ordinary shares	90,000	1,50,000
Market price per share	Rs. 1.20	Re. 1.00
6% Debentures	60,000	—
Profit before interest	Rs. 18,000	Rs. 18,000

All profits after debenture interest are distributed as dividends.

You are required to explain how under Modigliani & Miller approach, an investor holding 10% of shares in Company 'X' will be better off in switching his holding to Company 'Y'.

Solution :

In the opinion of Modigliani and Miller, two identical firms in all respects except their capital structure cannot have different market values because of arbitrage process. In case two identical firms except for their capital structure have different market values, arbitrage will take place and the investors will engage in 'personal leverage' as against the corporate leverage. In the given problem, the arbitrage will work out as below :

1. The investor will sell in the market 10% of shares in company × for Rs. 10,800, *i.e;* $\left(\frac{10}{100} \times 90{,}000 \times 1.20\right)$
2. He will raise a loan of Rs. 6,000 $\left(\frac{10}{100} \times 60{,}000\right)$ to take advantage of personal leverage as against the corporate leverage as company Y does not use debt content in its capital structure.
3. He will buy 16,800 shares in company Y with the total amount realised from 1 and 2, i.e. Rs. 10,800 plus Rs. 6,000. Thus, he will have 11.2% of shares in company Y :

The investor will gain by switching his holding as below :

Present income of the investor in company X :	
Profit before interest of the company	= Rs. 18,000
Less : Interest on debentures (6%)	= Rs. 3,600
Profit after interest	= Rs. 14,400
Share of the investor (10% of Rs. 14,400)	= Rs. 1440
Income of the Investor after switching holding to company Y	
Profit before interest for company Y	= Rs. 18,000
Less : Interest	= Nil
Profit after interest	= Rs. 18,000
Share of the investor (11.2% of Rs. 18,000)	= Rs. 2,016
Less : Interest paid on loan taken 6% of Rs. 6,000	= Rs. 360
Net Income of the Investor	= Rs. 1,656

As the net income of the investor in company Y is higher than the loss of income in company X due to switching the holdings, the investor will gain in switching his holdings to company Y.

Problem 14.6. The values for two firms X and Y in accordance with the traditional theory are given below :

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	X	*Y*
Expected Operating Income (x)	Rs. 50,000	Rs. 50,000
Total cost of Debt (kd. D = R)	0	10,000
Net Income	50,000	40,000
Cost of Equity (ke)	0.10	0.11
Market value of shares (s)	5,00,000	3,60,000
Market value of Debt (D)	0	2,00,000
Total value of the Firm (V=S+D)	5,00,000	5,60,000
Average cost of capital (ke)	0.10	0.09
Debt Equity Ratio	0	0.556

Compute the values for the firms X and Y as per the MM these Assume that :

(i) Corporate income taxes do not exist, and

(ii) The equilibrium value of K_e is 12.5%.

Solution :

COMPUTATION OF THE VALUES OF THE FIRMS

	Firm 'X' (Rs.)	*Firm 'Y'* (Rs.)
Expected Operating Income (x)	50,000	50,000
Less : Cost of Debt ($K_d \times D = R$)	—	10,000
Net Income for Equity (x–R)	50,000	40,000
Equilibrium value of K_e (12.5%)	0.125	0.125
Market Value of the Firm (V) = $\frac{50,000}{0.125}$	4,00,000	4,00,000
Market Value of Debt (D)	—	2,00,000
Market Value of Equity (S – VD)	4,00,000	2,00,000
Cost of Equity (K_e) = $\frac{X - R}{S}$	12.5%	20%

Problem 14.7. The Evergreen Company has the choice for raising an additional sum of Rs. 50 lakhs either by the sale of 10% debentures or by issue of additional equity shares at Rs. 50 per share. The current capitalisation structure of the company consists of 10 lakhs ordinary shares and no debt. At what level of earnings before interest and tax (EBIT) after the new capital is acquired, would earning per share (EPS) be the same whether new funds are raised either by issuing ordinary shares or by issuing debentures ? Also determine the level of EBIT at which Uncommitted Earnings Per Share (UEPS) would be the same, if sinking fund obligations amount to Rs. 5 lakhs per year. Assume a 50% tax rate. *(C.A. Final)*

Solution :

Existing capital Structure is 10,00,000 equity shares of Rs. 50 each and no debt.

	Alternative I	*Alternative II*
Raising of Rs. 50 lakhs.	10% Debentures	1,00,000 equity shares of Rs. 50 each
Proposed Alternative Capital Structure	10,00,000 equity shares of Rs. 50 each, *i.e.*, Rs. 550 lakhs + Rs. 50 lakhs Debentures	11,00,000 equity shares of Rs. 50 each, *i.e.*, Rs. 550 lakhs

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The level of EBIT where Earnings Per Share will be equal under both the alternatives can be determined with the help of the following formula :

$$\frac{(X-I) \times 50\% \text{ Tax}}{S_1} = \frac{(X - I) \times 50\% \text{ of Tax}}{S_2}$$

where, X = Level of EBIT
I = Interest on debentures
S_1 = No. of Equity Shares in alternative I.
S_2 = No. of Equity Shares in alternative II.

So, $$\frac{X-5,00,000 \times 50\%}{10,00,000} = \frac{(X-0) \times 50\%}{11,00,000}$$

$$\frac{.5X - 2,50,000}{10,00,000} = \frac{.5X}{11,00,000}$$

or $5,50,000\ X - 27,50,000 = 5,00,000\ X$

or $5,50,000\ X - 5,00,000\ X = 27,50,000$

or $50,000\ X = 27,50,000,\ X = 55$ (Lakhs rupees)

At a level of earnings of Rs. 55 lakhs, Earnings Per Share in both the alternatives will be equal.

Proof :

(Rs. in lakhs)

	Alternatives I	II
Earnings Before Int. & Tax	55.00	55.00
Less : Interest	5.00	—
Earnings Before Tax	50.00	55.00
Less : Tax @ 50%	25.00	27.50
Earnings After Tax	25.00	27.50
No of shares	10 lakhs	11 lakhs
Earning Per Share (EPS)	$\frac{25}{10} = 2.5$	$\frac{27.50}{11} = 2.5$

If, in addition, sinking fund obligation of Rs. 5 lakhs is required, the EBIT required will be :

$$\frac{[(X-5,00,000) \times 50\%] - 5,00,000}{10,00,000} = \frac{(X - 0) \times 50\%}{11,00,000}$$

or $$\frac{0.5\ X - 2,50,000 - 5,00,000}{10,00,000} = \frac{.5X}{11,00,000}$$

or X = Rs. 165 lakhs.

Proof :

(Rs. in lakhs)

	Alternatives I	II
EBIT	165.00	165.00
Less : Interest	5.00	—
Earnings Before Tax	160.00	165.00

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Less : Tax @ 50%	80.00	82.50
Less : Sinking Found Contributions	5.00	—
Earnings Available to shareholders	75.00	82.50
No. of Shares	10 lakhs	11 lakhs
	$\frac{75}{10}$ =	$\frac{82.50}{11}$ =
	Rs. 7.5	Rs. 7.5

Problem 14.8. AB limited provides you with following figures :–

	Rs.
Profit	3,00,000
Less : Interest on Debentures @ 12%	60,000
	2,40,000
Income-tax @ 50%	1,20,000
	1,20,000
Number of Equity Shares (Rs. 10 each)	40,000
E.P.S. (Earning per share)	3
Ruling price in market	30
PE ratio (Price/EPS)	10

The company has undistributed reserves of Rs. 6,00,000. The company needs Rs. 2,00,000 for expansion. This amount will earn at the same rate as funds already employed. You are informed that a debt equity ratio $\frac{\text{debt}}{\text{debt + equity}}$ higher than 35% will push the P/E ratio down to 8 and raise the interest rate on additional amount borrowed to 14%. You are required to ascertain the probable price of the share :

(i) If the additional funds are raised as debt ; and
(ii) If the amount is raised by issuing shares.

Solution :

ASCERTAINMENT OF PROBLEM PRICE OF SHARES OF AB LIMITED

Particulars	*Plan (i) (If Rs. 2,00,000 is raised as debt)* (Rs.)	*Plan (ii) (If Rs. 2,00,000 is raised by issuing equity shares)* (Rs.)
Earnings Before Interest and Tax (EBIT) :		
20% on (15,00,000 + 2,00,000)[1]	3,40,000	3,40,000
Less : Interest on old debentures @ 12% on Rs. 5,00,000	60,000	60,000
Less : Interest on new debt @ 14% on Rs. 2,00,000	28,000	—
Earnings Before Tax (After Interest)	2,52,00	2,80,000
Less : Tax @ 50%	1,26,000	1,40,000
Earnings for Equity Shareholders (EAIT)	1,26,000	1,40,000
Number of Equity Shares	40,000	46,667
Earnings Per Share (EPS)	Rs. 3.15	Rs. 3.00
Price/Earning Ratio	8	10
Probable Price Per Share	3.15 × 8 = Rs. 25.20	3 × 10 = Rs. 30.00

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Working Notes :

1. *Calculation of Present Rate of Earnings*

	Rs.
Equity Share Capital (40,000 × 10)	= 4,00,000
12% Debentures $\left(60{,}000 \times \frac{100}{12}\right)$	= 5,00,000
Reserves (given)	= 6,00,000
Capital Employed at Present	15,00,000
Earnings Before Interest and tax (EBIT) given	= 3,00,000
Rate of Present Earnings $\frac{3{,}00{,}000}{15{,}00{,}000} \times 100 = 20\%$	= 20%

2. *Number of Equity Shares to be issued in Plan (ii)*

$$= \frac{2{,}00{,}000}{30} = 6{,}667$$

Thus, after the issue total number of shares= 40,000 + 6,667
= 46,667

3. *Debt/Equity Ratio if Rs. 2,00,000 is raised as debt :*

$$\frac{7{,}00{,}000}{17{,}00{,}000} \times 100 = 41.2\%$$

As the debt-equity ratio is more than 35%, the P/E ratio shall be 8 in plan *(ii)*..

Problem 14.9. Firms X and Y identical are except that firm X is not levered while Firm Y is levered. The following data relate to them :

	Firm X	*Firm Y*	
	Rs.	*Rs.*	
Assets	5,00,000	5,00,000	
Debt capital	0	2,50,000	(9% Int)
Equity share capital	5,00,000	2,50,000	
No. of shares	(50,000)	(25,000	
Rate of Return on assets	20%	20%	

Calculate EPS for both firms, assuming tax rate of 50%. Will it be advantageous to firm Y to raise the level of debt capital to 75% ?

Solution :

COMPUTATION OF EARNINGS PER SHARE (EPS)

	Firm X	*Firm Y*	
	(Rs.)	*(Using 50% debt) (Rs.)*	*(Using 75% Debt) (Rs.)*
Earnings Before Interest and Tax (EBIT) 20% on Rs. 5,00,000	1,00,000	1,00,000	1,00,000
Less : Interest @ 9%	—	22,500	33,750
	1,00,000	77,500	66,250
Less : Tax @ 50%	50,000	38,750	33,125
Earnings for Equity Shareholders (EAIT)	50,000	38,750	33,125
No. of Equity Shares	50,000	25,000	12,500
Earnings Per Share $(EPS) = \frac{EAIT}{No.\ of\ Shares}$	1.00	1.55	2.65

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EPS of firm 'Y' which is levered is higher than the unlevered firm 'X'. It is because of two reasons ; *(i)* rate of earnings is more than the rate of interest on debt, and *(ii)* interest is a deductible expense for income-tax purposes. Further, it will be advantageous to firm Y to raise the level of debt to 75% for the same reasons and the EPS will improve from Rs. 1.55 per share to Rs. 2.65 per share.

Problem 14.10. A Company Ltd., has a share capital of Rs. 1,00,000 dividend into shares of Rs. 10 each. It has major expansion programme requiring an investment of another Rs. 50,000. The management is considering the following alternatives for raising this amount :

(i) Issue of 5,000 shares of Rs. 10 each.

(ii) Issue of 5,000, 12% preference shares of Rs. 10 each.

(iii) Issue of 10% debentures of Rs. 50,000.

The company's present earning before interest and Tax (EBIT) is Rs. 30,000 p.a.

You are required to calculate the effect of each of the above modes of financing on the earnings per share (EPS) presuming.

(a) EBIT continues to be the same even after expansion ;

(b) EBIT increases by Rs. 10,000.

(c) Assume tax liability at 50%.

Solution :

(a) **WHEN EBIT CONTINUES TO BE THE SAME AT RS. 30,000**

	Plan I (Rs.)	*Plan II (Rs.)*	*Plan II (Rs.)*
Earnings Before Interest and Tax (EBIT)	30,000	30,000	30,000
Less : Interest on debentures @ 10%	—	—	5,000
Earnings Before tax (EBT)	30,000	30,000	25,000
Less : Tax @ 50%	15,000	15,000	12,500
Earnings After Interest and Tax	15,000	15,000	12,500
Less : Preference Divided	—	6,000	—
Earnings for Equity Shareholders	15,000	9,000	12,500
No. of Equity Shares	15,000	10,000	10,000
Earnings Per Share (EPS)	$\frac{15,000}{15,000} = 1.00$	$\frac{9,000}{10,000} = 0.90$	$\frac{12,500}{10,000} = 1.25$

(b) **WHEN EBIT INCREASES BY RS. 10,000**

	Plan I (Rs.)	*Plan II (Rs.)*	*Plan III (Rs.)*
EBIT	40,000	40,000	40,000
Less : Interest on Debentures	—	—	5,000
EBT	40,000	40,000	35,000
Less : Tax @ 50%	20,000	20,000	17,500
EAIT	20,000	20,000	17,500
Less : Preference Dividend	—	6,000	—
	20,000	14,000	17,500
No. of Equity Shares	15,000	10,000	10,000
EPS	$\frac{20,000}{15,000} = 1.33$	$\frac{14,000}{10,000} = 1.40$	$\frac{17,500}{10,000} = 1.75$

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15

Cost of Capital

Problem 15.1. X Ltd. issues 50,000 8% Debentures of Re. 1 each at a premium of 10%. The costs of floatation are 2%. The rate of tax applicable to the company is 60%. Compute the cost of debt capital.

Solution :

The after-tax cost of debt is :

$$K_d = \frac{I}{NP}(1-t)$$

where, K_d = Cost of debt Capital
I = Interest charges
NP = Net Proceeds
t = Rate of tax.

Net Proceeds (NP)

$$= \text{Rs. } (5,00,000 + 50,000) - \left(\frac{2}{100} \times 5,50,000\right)$$

$$= \text{Rs. } 5,50,000 - 11,000$$

$$= \text{Rs. } 5,39,000$$

$$K_d = \frac{40,000}{5,39,000}(1-.6)$$

$$= \frac{40,000}{5,39,000} \times \frac{4}{10}$$

$$= 2.96\%$$

Problem 15.2. A company issues 5,000 12% debentures for Rs. 100 each at a discount of 5%. The commission payable to underwriters and brokers is Rs. 25,000. The debentures are redeemable after 5 years. Compute the after-tax cost of debt assuming a tax rate of 50%.

Solution :

After tax cost of debt :

$$K_d = \frac{I + \left(P - \frac{NP}{n}\right)}{(P + NP)/2}(1 - t)$$

$$= \frac{60,000 + \left(\frac{5,00,000 - 4,75,000}{5}\right)}{(5,00,000 + 4,75,000)/2}(1 - .5)$$

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$$= \frac{60,000 + 5,000}{4,87,500} \times .5$$

$$= \frac{65,000}{4,87,500} \times \frac{5}{10}$$

$$= 6.66\%.$$

Problem 15.3. *(i)* A Company issues 1,000 10% Preference Shares of Rs. 100 each at a discount of 5%. Costs of raising capital are Rs. 2,000. Compute the cost of Preference Capital.

(ii) Assume that the firm pays tax at 50%. Compute the after tax cost of capital of a preferred share sold at Rs. 100 with a 9% dividend and a redemption price of Rs. 110, if the company redeems it in five years.

Solution :

(i) $K_p = \frac{D}{NP}$

where, K_p = Cost of Preference Capital
D = Dividend
NP = Net Proceeds

$$K_p = \frac{10,000}{93,000}$$

$$= 10.75\%$$

(ii) $$K_p = \frac{D + \frac{1}{n}(F - P)}{\frac{1}{2}(F + P)}$$

where, n = Number of years in which to be redeemed.
F = Redemption Price

$$K_p = \frac{9 + \frac{1}{5} 110 - 100)}{\frac{1}{2}(110 + 100)}$$

$$= \frac{9 + 2}{\frac{1}{2}(210)}$$

$$= \frac{11}{105}$$

$$= 10.47\%.$$

Problem 15.4. Your company's share is quoted in the market at Rs. 20 currently. The company pays a dividend of Re. 1 per share and the investor's market expects a growth rate of 5 percent per year.

(a) Compute the company's equity cost of capital ;

(b) If the anticipated growth rate is 6% p.a., calculate the indicated market price per share ;

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(c) If the company's cost of capital is 8% and the anticipated growth rate is 5% p.a., calculate the indicated market price if the dividend of Re. 1 per share is to be maintained. *(I.C.W.A., Final)*

Solution :

$$K_e = \left(\frac{D}{P} \times 100\right) + G$$

where, K_e = Cost of Equity Capital
D = Dividend
P = Market Price of the Share
G = Growth Rate

$$K_e = \frac{1}{20} \times 100 + 5$$

$$= 10\%$$

(b) $$K_e = \frac{D}{P} + G$$

or, $$10\% = \frac{1}{P} + 6\%$$

or, $$\frac{1}{P} = 10\% - 6\%$$

or, $$\frac{1}{P} = 4\%$$

or, $$P = \frac{1}{4}\%$$

or, $$P = \text{Rs. } 25$$

(c) $$K_e = \frac{D}{P} + G$$

or, $$8\% = \frac{1}{P} + 5\%$$

or, $$\frac{1}{P} = 8\% - 5\%$$

or, $$\frac{1}{P} = 3\%$$

or, $$P = \frac{1}{3}\% = \text{Rs. } 33.33$$

Problem 15.5. X is a shareholder in ABC Company Ltd. Although earnings for the ABC Ltd. have varied considerably, X has determined that long run average dividends for the firm have been Rs. 2 per share. He expects a similar pattern to prevail in the future. Given the volatility of the ABC's dividends X has decided that a minimum rate of 20% should be earned on his share. What price would X be willing to pay for the ABC's shares ? *(Adapted M. Com. Delhi)*

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Solution :

$$= K_e = \frac{D}{P} + G$$

where, K_e = Cost of Equity Capital
D = Dividend
P = Market Price of Share
G = Growth Rate

$$K_e = \frac{D}{P} + G$$

$$20\% = \frac{2}{P} + O \quad \text{(because growth rate is zero)}$$

or, $$P = \frac{2}{20} \times 100$$
$$= \text{Rs. } 10$$

So, X would be willing to pay Rs. 10 per share for ABC's Share.

Problem 15.6. A mining company's iron ore reserves are being depleted and its costs of recovering a declining quantity of iron ore are rising each year. As a sequel to it the company's earnings and dividends are declining at a rate of 10% p.a. If the previous year's dividend (DO) was Rs. 20 and the required rate of return is 20%, what would be the current price of the equity share of the company.

Solution :

$$MP = \frac{ED}{K_e - G}$$

where, MP = Market Price of Share
ED = Expected Dividend
G = Growth Rate

As Growth rate (G) is negative in the given question, hence

$$ED = \text{Rs. } 20\ (1 - .10)$$
$$= \text{Rs. } 18$$

$$MP = \frac{\text{Rs. } 18}{20\% - (-10\%)}$$

$$= \frac{\text{Rs. } 18}{30\%} = \text{Rs. } \frac{18 \times 100}{30}$$

$$= \text{Rs. } 60.$$

Problem 15.7. Excel Industries Ltd. has assets of Rs. 1,60,000 which have been financed with Rs. 52,000 of debt and Rs. 90,000 of equity and a general reserve of Rs. 18,000. The firm's total profits after interest and taxes for the year ended 31st March, 1997 were Rs. 13,500. It pays 8% interest on borrowed funds and is in the 50% tax bracket. It has 900 equity shares of Rs. 100 each selling at a market price of Rs. 120 per share. What is the weighted average cost of capital ? *(M. Com Delhi)*

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Solution :

$$\text{Earning Per Share (EPS)} = \frac{\text{Earnings after int. \& taxes}}{\text{No. of Shares}}$$

$$= \text{Rs. } \frac{13,500}{900}$$

$$= \text{Rs. } 15$$

Cost of Debt :

K_d = I (1 – t) where, K_d = cost of debt

I = Rate of Interest

t = Rate of tax

= 8% (1 – .5)

= 4%

Cost of Equity :

$$K_e = \frac{EPS}{MP} \times 100$$

where K_e = Cost of equity capital

EPS = Earnings Per Shares

MP = Market Price of Share

So,

$$K_e = \frac{15}{120} \times 100$$

$$= 12.5\%$$

Weighted Average Cost of Capital :

Source of Capital	*Amount or Market Price*	*Specific Cost*	*Total Cost*
	Rs.		*Rs.*
Debt	52,000	4%	2,080
Equity	90,000	12.5%	11,250
Reserves	18,000	12.5%	2,250
	1,60,000		15,580

$$\text{Weighted Average Cost of Capital} = \frac{15,580}{1,60,000} \times 100$$

$$= 9.74\%$$

Note: Since cost of reserves is not given, it has been assumed to be same as cost of equity capital.

Problem 15.8. A company is considering raising of funds of about Rs. 100 lakhs by one of two alternative methods, viz., 14% institutional term loan and 13% non-convertible debentures. The term loan option would attract no major incidental cost. The debentures would have to be issued at a discount of 2.5% and would involve cost of issue of Rs. 1 lakh.

Advise the company as to the better option based on the effective cost of capital in each case, Assume a tax rate of 50%.

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Solution :

CALCULATION OF EFFECTIVE COST OF CAPITAL

		Options	
		I (14% Institutional) (Term Loan) (Rs. in lakhs)	*II* (13% Non-Convertible) Debentures) (Rs. in lakhs)
(i)	*Net Effective Amount of Capital :*		
	Face Value	100.00	100.00
	Less : Discount	—	2.50
		100.00	97.50
	Less : Cost of Issue	—	1.00
	Effective Amount of Capital	100.00	96.50
(ii)	*Net Cost of Capital :*		
	Interest	14.00	13.00
	Less : Saving in Tax (50%)	7.00	6.50
	Net Cost of Capital	7.00	6.50
(iii)	*Effective Cost of Capital*		
	$\frac{\text{Net Cost}}{\text{Net Amount of Capital}} \times 100$	$\frac{7}{100} \times 100$ = 7%	$\frac{6.5}{96.5} \times 100$ 6.736%

As the effective cost of capital of non-convertible debentures (6.736%) is less than the cost of institutional loan (7.0%); it is better to raise funds by issue of 13% non-convertible debentures.

Problem 15.9. The Xavier Corporation, a dynamic growth firm which pays no dividends, anticipates a long-run level of future earning of Rs. 7 per share. The current price of Xavier's share is Rs. 55.45, floatation costs for the sales of equity shares would average about 10% of the price of the shares. What is the cost of new equity capital to Xavier ?

Solution :

$$K_e = \frac{D}{NP}$$

where, K_e = Cost of Equity Capital
D = Expected Dividend Per Share
NP = Net Proceeds Per share

Substituting the values,

$$K_e = \frac{7}{(55.45) - \left(\frac{10}{100} \times 55.45\right)}$$

$$= \frac{7}{55.45 - 5.545}$$

$$= \frac{7}{49.90} = 0.1403$$

$$= 14.03\%$$

Problem 15.10. Calculate the average cost of capital before tax and after tax from the following information. Assume that the tax rate is 55%.

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Type of Capital	*Proportion in the New Capital Structure*	*Before-Tax Cost of Capital*
Equity Capital	25%	24.44%
Preference Capital	10%	27.29%
Debt Capital	50%	7.99%
Retained Earnings	15%	18.33%

Solution :

$$K_w = \frac{\Sigma XW}{\Sigma W}$$

where, K_w = Weighted average cost of capital
X = Cost of specific source of finance
W = Weight, proportion of specific sources of finance.

(i) **COMPUTATION OF (BEFORE TAX) WEIGHTED AVERAGE COST OF CAPITAL**

Types of Capital	*Proportion % (W)*	*Cost % (X)*	*Weighted Cost Proportion X Cost (XW)*
Equity Capital	25	24.44	611.00
Preference Capital	10	27.29	272.90
Debt Capital	50	7.99	399.50
Retained Earnings	15	18.33	274.95
	$\Sigma W = 100$		$\Sigma XW = 1558.35$

$$\therefore \text{Average Cost of Capital (Before Tax)}, K_w = \frac{\Sigma XW}{\Sigma W}$$

$$\text{or, } K_W = \frac{1558.35}{100}$$

$$= 15.58\%$$

(i) After-tax, Average Cost of Capital

$$= \text{Before-tax Cost of Capital} \times (1 - t)$$
$$= 15.55 \times (1 - .55)$$
$$= 15.58 \times 0.45$$
$$= 7.01\%$$

Problem 15.11. The following items have been extracted from the 'Liabilities' side of the Balance Sheet of ABC company as on 31st December 1995 :

Paid-up Capital :	*Rs.*
50,000 Equity Shares of Rs. 10 each	5,00,000
Reserves and Surplus	7,00,000
Loans :	
17% Non-Convertible Debentures	2,00,000
16% Institutional Loans	6,00,000

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Other information about the company as relevent is given below :

Year ended 31st Dec.	*Dividend per share (Rs.)*	*Earnings per share (Rs.)*	*Average Market Price per share (Rs.)*
1995	5.00	9.00	60.00
1994	4.00	7.50	50.00
1993	5.00	6.00	40.00

You are required to calculate the weighted average cost of capital, using book values as weights and Earnings/Price (E/P) ratio as the basis of cost of equity. Assume 50% tax rate.

Solution :

CALCULATION OF WEIGHTED AVERAGE COST OF CAPITAL

Capital Structure Or Type of Capital	*Book Value (Rs.)*	*Basis of Cost*	*After-Tax Rate*	*After-Tax Cost (Rs.)*
Equity Funds (5,00,000 + 7,00,000)	12,00,000	E/P Ratio $\frac{9.0}{60} \times 100$	15%	1,80,000
17% Non-Convertible Debentures	2,00,000	After-tax Interst (17% – 50% of Tax)	8.5%	17,000
16% Institutional Loan	6,00,000	After-tax Interest (16% – 50% Tax)	8.0%	48,000
Total	20,00,000			2,45,000

$$\text{Weighted Average Cost of Capital} = \frac{2,45,000}{20,00,000} \times 100$$

$$= 12.25\%$$

Problem 15.12. The following is an extract from the financial statements of XYZ Ltd.

	(Rs. lakhs)
Operating Profit	180
Less : Interest on Debentures	48
	132
Less : Income-tax (50%)	66
Net Profit	66
Equity Share Capital (Shares of Rs. 10 each)	300
Reserves and Surplus	150
16% Non-Convertible Debentures	300
	750

The market price per equity share is 11 and per debenture Rs. 95.

(i) What is the earning per share ?

(ii) What is the percentage cost of capital to the company for the equity and debenture funds ?

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Solution :

(i) Calculation of Earnings Per Share

$$\text{Earnings Per Share (EPS)} = \frac{\text{Profit After Tax}}{\text{No. of Equity Shares}}$$

$$\text{Or, E.P.S.} = \frac{66,00,000}{30,00,000} = \text{Rs. } 2.20.$$

(ii) Computation of Percentage Cost of Capital

(a) Cost of Equity Capital :

$$\text{Cost of Equity } (K_e) = \frac{D}{MP}$$

Where, D = Expected Earnings per share

and, MP = Market Price per share

$$\text{Or, } K_e\ (\%) = \frac{2.20}{11} \times 100$$

$$= 20\%$$

(iii) Cost of Debenture Funds :

	At Book Value (Rs. Lakhs)	*At Market Price (Rs. Lakhs)*
Value of 16% Debentures	300.00	285.00
Interest Cost for the year	48.00	48.00
Less : Tax at 50%	24.00	24.00
Interest Cost after tax	24.00	24.00
Cost of Debenture Funds (%)	$\frac{24.00}{300} \times 100$ = 8%	$\frac{24.00}{285} \times 100$ =8.42%

Problem 15.13. XYZ Ltd. is currently earning Rs. 1,00,000 and its share is selling at a market price of Rs. 80. The firm has 10,000 shares outstanding and has no debt. The earnings of the firm are expected to remain stable, and it has a payout ratio of 100%. What is the cost of equity ? If the firm's payout ratio is assumed to be 60% and that it earns 15% rate of return on its investment oppotunities, then what would be the firm's cost of equity ?

Solution :

(i) When the payout ratio is 100%

$$K_e = \frac{D}{MP}$$

$$= \frac{10}{80} \times 100$$

$$= 12.5\%$$

$\left(\text{Dividend is Rs. 10 per share, i.e. } \frac{1,00,000}{10,000}\right)$

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(ii) When the payout ratio is 60%

$$K_e = \frac{D \text{ (per share)}}{MP \text{ (per share)}} + g$$

Dividend Per Share = EPS × Payout Ratio

Or, DPS $= 10 \times \frac{60}{100} =$ Rs. 6.

Retention Ratio = 100 – 60% = 40%

As, the expected Return of Internal Investment opportunities is given to be 15% ; the firm's expected growth (g) is :

$$g = .40 \times .15 = 0.06 \text{ or } 6\%$$

$$K_e = \frac{DPS}{MPS} + g$$

$$= \frac{6}{80} + 0.06$$

$$= 13.5\%$$

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16

Leverages

Problem 16.1. Calculate the operating, financial and combined leverage from the following information :

	Rs.
Interest	5,000
Sales	50,000
Variable Cost	25,000
Fixed Costs	15,000

Solution :

(i) Operating Leverage $= \dfrac{\text{Contribution}}{\text{Earnings before interest and tax}}$

$= \dfrac{\text{Sales} - \text{Variable Cost}}{\text{Sales} - \text{Variable Cost} - \text{Fixed Cost}}$

$= \dfrac{50,000 - 25,000}{50,000 - 25,000 - 15,000}$

$= \dfrac{25,000}{10,000}$

$= 2.5$

(ii) Financial Leverage $= \dfrac{\text{EBIT}}{\text{EBIT} - \text{I}}$

$= \dfrac{50,000 - 25,000 - 15,000}{(50,000 - 25,000 - 15000) - 5000}$

$= \dfrac{10,000}{5,000}$

$= 2.0$

(iii) Composite Leverage = Operating Leverage × Financial Leverage

$= 2.5 \times 2.0$

$= 5.$

Problem 16.2. A firm has sales of Rs. 10,00,000 variable cost Rs. 7,00,000 and fixed cost Rs. 2,00,000 and debt of Rs. 5,00,000 at 10% rate of interest.

What are the operating and financial leverages ?

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Solution :

(i) Operating Leverage $= \dfrac{\text{Contribution}}{\text{EBIT}}$

$= \dfrac{10,00,000-7,00,000}{10,00,000-7,00,000-2,00,000}$

$= \dfrac{3,00,000}{1,00,000} = 3$

(ii) Financial Leverage $= \dfrac{\text{EBIT}}{\text{EBIT}-I}$ $\left(\begin{array}{l} I = \text{Interest} \\ \quad = 5,00,000 \times \dfrac{10}{100} \end{array}\right)$

$= \dfrac{1,00,000}{1,00,000-50,000}$

$= \dfrac{1,00,000}{50,000} = 2.$

Problem 16.3. Calculate degree of operating leverage, financial leverage and combined leverage from the following data

Sales 1,00,000 units @ Rs. 2 unit-Rs.2,00,000

Variable cost per unit @ Re. 0.70

Fixed Costs - Rs. 1,00,000

Interest changes - Rs. 3,668

Solution :

(i) Operating Leverage $= \dfrac{\text{Contribution}}{\text{EBIT}}$

Contribution = Sales – Variable Cost

= Rs. 2,00,000–(1,00,000×0.70)

= Rs. 1,30,000

EBIT = Sales–V.C–F.C.

= 2,00,000–70,000–1,00,000

= Rs. 30,000

$\therefore$ O.L. $= \dfrac{1,30,000}{30,000}$

$= 4.33$

(ii) Financial Leverage $= \dfrac{\text{EBIT}}{\text{EBIT}-I}$

$= \dfrac{30,000}{30,000-3,668}$

$= \dfrac{30,000}{26,332}$

$= 1.14$

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(iii) Combined Leverage = OL×FL

= 4.33×1.14

= 4.94

Problem 16.4. A firm has sales of Rs. 20,00,000, variable cost of Rs. 14,00,000 fixed costs of Rs. 4,00,000 and debentures of Rs. 10,00,000 in its capital structure obtained @ 10 percent. What are its financial leverage, operating leverage and combined leverage ?

Solution :

(i) Financial Leverage $= \frac{\text{EBIT}}{\text{EBIT}-\text{I}}$

EBIT = 20,00,000 − 14,00,000−4,00,000 = Rs. 2,00,000

$$\therefore \text{F.L.} = \frac{2,00,000}{2,00,000-10\% \text{ of } 10,00,000}$$

$$= \frac{2,00,000}{1,00,000}$$

= 2.

(ii) Operating Leverage $= \frac{\text{Contribution}}{\text{EBIT}}$

Contribution = Sales−variable cost

= 20,00,000 − 14,00,000

= Rs. 6,00,000

$$\therefore \text{OL} = \frac{6,00,000}{2,00,000} = 3$$

(iii) Combined Leverage= OL×FL

= 3×2

= 6.

Problem 16.5. X Corporation has estimated that for a new product its break-even point is 2000 units, if the item is sold for Rs. 14 per unit. The cost account department has currently identified variable cost of Rs. 9 per unit. Calculate the degree of operating leverage for sales valume of 2,500 units and 3,000 units, what do you infer from the degree of operating leverage at the sales volume of 2,500 units and 3,000 units and their difference, if any ?

Solution :

(i) Calculation of Fixed Costs

$$\text{Break Even Point} = \frac{\text{Fixed Cost}}{\text{Contribution}}$$

$$\text{Or, B.E.P.} = \frac{\text{FC}}{\text{S}-\text{V}}$$

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$$\text{Or, } 2{,}000 = \frac{FC}{14-9}$$

Or Fixed Costs = Rs. 10,000

(ii) Calculation of contribution and Operating Profit

	Per Unit (Rs.)	*2500 units* (Rs.)	*3,000 units* (Rs)
Sales	14	35,000	42,000
Less :Variable Cost	9	22,500	27,000
Contribution	5	12,500	15,000
Less : Fixed costs		10,000	10,000
Operating Profit		2,500	5,000

$$\textit{(iii) Operating Leverage} = \frac{\text{Contribution}}{\text{Operating Profit}}$$

$$\therefore \text{O. L. (at 25000 units)} = \frac{12{,}500}{2{,}500} = 5$$

$$\text{and, O.L. (at 3000 units)} = \frac{15{,}000}{5{,}000} = 3$$

(iv) Inference. The degree of operating leverage at sales volume of 2,500 units is much higher than the degree of operating leverage at sales volume of 3,000 units. At 2,500 units, the operating leverage is 5, which implies that for every increase in sales volume the operating profit will increase by 5 times. It is also clear from the fact that when sales increase from 2500 units to 3000, *i.e.* by 500 units, the profit increases by Rs. 2,500 (5000-2500), which is 5 times the increase in sales volume. However, at sales volume of 3,000 units, the degree of operating leverage is 3, which means that at this level the profit will increase by three times the increase in sales volume.

Problem 16.6. The following data are available for X Ltd :

Selling Price per unit = Rs. 120

(i) What is the operating leverage when X Ltd. produces and sells 6,000 units?

(ii) What is the percentage change that will occur in the EBIT of X Ltd. If output increases by 5% ?

Solution :

$$\text{(i) Operating Leverage} = \frac{\text{Contribution}}{\text{Earnings Before Interest and Tax (EBIT)}}$$

Contribution = Sales − Variable cost

At 6000 units, Contribution = Rs. (6000×120) − (6000×70)

= Rs. 7,20,000 − 4,20,000

= Rs. 3,00,000.

EBIT = Contribution − Fixed cost

= Rs. 3,00,000 − 2,00,000

= Rs. 1,00,000

$$\therefore \text{Operating Leverage} = \frac{3{,}00{,}000}{1{,}00{,}000} = 3$$

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(ii) Percentage Change in EBIT. The operating leverage 3 implies that the operating profit (EBIT) will increase three times the increase in output/sales volume.Thus, if the output/sales increase by 5%, it result into 15%, *i.e.* 3×5, increase in EBIT.

Problem 16.7. A company's capital structure consists of Rs. 5,00,000 (shares of Rs. 100 each) equity capital and Rs. 2,00,000 10% Debentures. The sales increased by 20% from 50,000 units to 60,000 units; the selling price is Rs. 10 per unit; variable cost amounts to Rs. 6 per unit and fixed expenses amount to Rs. 1,00,000. The rate of income tax is assumed to be 50 per cent.

You are required to calculate :

(i) The percentage increase in earnings per share.

(ii) The degree of financial leverage at 50,000 units and 60,000 units.

(iii) The degree of operating leverage at 50,000 units and 60,000 units.

Solution :

CALCULATION OF CONTRIBUTION AND PROFIT

	50,000 units (Rs.)	*60,000 units (Rs.)*
Sales (Rs. 10 per unit)	5,00,000	6,00,000
Less: Variable cost (Rs. 6 per unit)	3,00,000	3,60,000
Contribution	2,00,000	2,40,000
Less : Fixed Costs	1,00,000	1,00,000
Operating Profit (EBIT)	1,00,000	1,40,000
Less : Interest (10% of Rs. 2,00,000)	20,000	20,000
Profit Before (PBT)	80,000	1,20,000
Less : Tax (50%)	40,000	60,000
Profit After Tax	40,000	60,000

(i) Earnings Per Share (EPS) $= \dfrac{\text{Profit After Tax}}{\text{Number of Shares}}$

EPS (At 50,000 units) $= \dfrac{40,000}{5,000} = \text{Rs. } 8.$

EPS (At 60,000 units) $= \dfrac{60,000}{5,000} = \text{Rs. } 12$

Thus, percentage increase in EPS = 50%

(ii) Financial Leverage $= \dfrac{\text{EBIT}}{\text{EBIT}-T} = \dfrac{\text{EBIT}}{\text{PBT}}$

Or, F.L. (At 50,000 units) $= \dfrac{1,00,000}{80,000} = 1.25$

and, F.L. (At 60,000 units) $= \dfrac{1,40,000}{1,20,000} = 1.17.$

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(iii) Operating Leverage $= \frac{\text{Contribution}}{\text{EBIT}}$

$$\text{O.L. (At 50,000 units)} = \frac{2,00,000}{1,00,000} = 2$$

$$\text{O.L. (At 60,000 units)} = \frac{2,40,000}{1,40,000} = 1.71$$

Problem 16.8. The capital structure of the Progressive Corporation Ltd., consists of an equity share capital of Rs. 10,00,000 (Shares of Rs. 10 par value) and Rs. 10,00,000 of 20% debentures. Sales increased by 25% from 2,00,000 units to 2,50,000 units, the selling price is Rs. 10 per unit, variable costs amount to Rs. 6 per unit and fixed expenses amount to Rs. 2,50,000. Income tax rate is asssumed to be 50%

(a) You are required to calculate the following :

(i) The percentage increase in Earnings per Share.

(ii) The degree of financial leverage at 2,00,000 units and 2,50,000 units.

(iii) The degree of operating leverage at 2,00,000 units and 2,50,000 units.

Solution :

CALCULATION OF CONTRIBUTION AND P

	2,00,000 Units Rs.	*2.50,000 Units* Rs.
Sales (Rs. 10 per unit)	20,00,000	25,00,000
Less: Variable cost (Rs. 6 per unit)	12,00,000	15,00,000
Contribution	8,00,000	10,00,000
Less: Fixed costs	2,50,000	2,50,000
Operating Profit (EBIT)	5,50,000	7,50,000
Less : Interest (20% of Rs. (10,00, 000)	2,00,000	2,00,000
Profit Before Tax (PBT)	3,50,000	5,50,000
Less : Tax (50%)	1,75,000	2,75,000
Profit After Tax	1,75,000	2,75,000

(i) Earnings Per Share (EPS) $= \frac{\text{Profit After Tax}}{\text{Number of Shares}}$

$$\text{EPS (at 2,00,000 units)} = \frac{1,75,000}{1,00,000} = \text{Rs. } 1.75$$

$$\text{EPS (at 2,50,000 units)} = \frac{2,75,000}{1,00,000} = \text{Rs. } 2.75$$

$$\text{Percentage increase in EPS} = \frac{2.75-1.75}{1.75} \times 100 = 57.14\%$$

(ii) Financial Leverage $= \frac{\text{EBIT}}{\text{PBT}}$

$$\text{F.L. (at 2,00,000 units)} = \frac{5,50,000}{3,50,000} = 1.57$$

$$\text{F.L. (at 2,50,000 units)} = \frac{7,50,000}{5,50,000} = 1.36$$

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(iii) Operating Leverage $= \dfrac{\text{Contribution}}{\text{EBIT}}$

O.L. (at 2,00,000 units) $= \dfrac{8,00,000}{5,50,000} = 1.45$

O.L. (at 2,50,000 units) $= \dfrac{10,00,000}{7,50,000} = 1.33$

Problem 16.9. Calculate financial leverage and operating leverage under situations A and B and Financial Plans I and II respectively from the following information relating to the operation and capital structure of ABC Ltd.

Installed capacity	1,000 units
Actual Production and sales	800 units
Selling price per unit	Rs.20
Variable cost per unit	Rs. 15
Fixed costs : Situation A	Rs. 800
Situation B	Rs. 1,500

Capital Structure :

	Financial Plan	
	I	II
Equity	Rs. 5,000	Rs.7,000
Debt (Cost of Debt 10%)	Rs.5,000	Rs.2,000

How will various calculations be useful to the Financial Manager of the company?

Solution :

COMPUTATION FOR OPERATING LEVERAGE

	Situations	
	A *(Rs.)*	*B* *(Rs.)*
Sales (800 units @ Rs. 20 per unit)	16,000	16,000
Less : Variable cost (800×15)	12,000	12,000
Contribution	4,000	4,000
Less: Fixed Costs	800	1,500
Operating Profit (EBIT)	3,200	2,500
Operating Leverage $\left(\dfrac{C}{EBIT}\right)$	4000 / 3200 = 1.25	4000 / 2500 = 1.60

COMPUTATION OF FINANCIAL LEVERAGE

Situation A:	*Plan I* *(Rs.)*	*Plan II* *(Rs.)*
Operating Profit (EBIT)	3,200	3,200
Less: Interest (10% of Debt)	500	200
Profit Before Tax (PBT)	2,700	3,000
Financial Leverage $\left(\dfrac{EBIT}{PBT}\right)$	3200 / 2700	3200 / 3000

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	=1.19	=1.067
Situation B:		
Operating Profit (EBIT)	2,500	2,500
Less: Interest (10% of Debt)	500	200
Profit Before Tax	2,000	2,300
Financial Leverage $\left(\frac{\text{EBIT}}{\text{PBT}}\right)$	2500 / 2000	2,500 / 2,300
	1.25	=1.087

Problem 16.10. Calculate operating leverage and financial leverage from the following data:

Sales (1,00,000 units)	= Rs. 2,00,000
Variable cost per unit	= Rs. 0.70
Fixed Cost	= Rs. 65,000
Interest Charges	= Rs. 15,000

Solution :

(i) Operating Leverage $= \dfrac{\text{Contribution}}{\text{EBIT}}$

$= \dfrac{2,00,000-70,000}{2,00,000-70,000-65,000}$

$= \dfrac{1,30,000}{65,000}$

$= 2$

(ii) Financial Leverage $= \dfrac{\text{EBIT}}{\text{EBIT}-\text{I}}$

$= \dfrac{65,000}{65,000-15,000}$

$= \dfrac{65,000}{50,000}$

$= 1.30$

Problem16.11. Balance Sheet of X Ltd. as on 31-3-1995 is as follows :

BALANCE SHEET

Liabilities	*Rs.*	*Assets*	*Rs.*
Equity Capital		Net Fixed Assets	150,000
(Rs.10 per share)	60,000	Current Assets	50,000
10% Debentures	80,000		
Retained earnings	20,000		
Current liabilities	40,000		
	2,00,000		2,00,000

The Company's total assets turnover ratio is 3. Its fixed operating costs are Rs. 100,000 and its variable operating cost ratio is 40%, the income tax rate is 50%.

(i) Calculate for the company all the three types of leverages.

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(ii) Determine the likely level of EBIT if EPS is Rs. 5.

Solution :

Total Assets Turnover = 3
Total Assets = Rs. 2,00,000
∴ Sales = Rs. 2,00,000 ×3 = Rs. 6,00,000

(i) Calculation of Leverages

	(Rs.)
Sales	6,00,000
Less: Variable cost (40%)	2,40,000
Contribution	3,60,000
Less : Fixed Costs	1,00,000
Operating Profit (EBIT)	2,60,000
Less : Interest (10% of 80,000)	8,000
Earnings Before Tax	2,52,000

(a) Operating Leverage $= \frac{\text{Contribution}}{\text{EBIT}}$

$= \frac{3,60,000}{2,60,000}$

$= 1.385$

(b) Financial Leverage $= \frac{\text{EBIT}}{\text{PBT}}$

$= \frac{2,60,000}{2,52,000}$

$= 1.0317$

(c) Composite Leverage = Operating Leverage × Financial Leverage

$= 1.385 \times 1.0317$

$= 1.429$

(ii) Calculation of EBIT, if EPS is Rs. 5

Number of shares = 60,000 ÷ 10 = 6,000
Earnings Per Share = Rs. 5
Total Earnings (after tax) = Rs. 6000 × 5 = Rs. 30,000

Earnings Before Tax = Rs.30,000 $\times \frac{100}{50}$ $\begin{pmatrix}\text{as rate of}\\ \text{tax is 50\%}\end{pmatrix}$

Or, EBT = Rs. 60,000
Earnings Before Interest and Tax = EBT + Interest
Or, EBIT = Rs. 60,000+8,000
= Rs. 68,000

Problem 16.12. The selected finanancial data for A, B and C companies for the year ended December 31, 1995 are as follows :

	A	B	C
Variable expenses as a percentage of sales	$66^2/_3$	75	50

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Interest expenses	Rs.200	Rs.300	Rs.1,000
Degree of operating leverage	5-1	6-1	2-1
Degree of financial leverage	3-1	4-1	2-1
Income-tax rate	0.50	0.50	0.50

Prepare income statements for A,B and C companies.

Solution :

(a) Company A

(i) Calculation of EBIT

$$\text{Degree of Financial Leverage} = \frac{\text{EBIT}}{\text{EBIT} - \text{I}}$$

$$3 = \frac{\text{EBIT}}{\text{EBIT}-\text{I}}$$

Or, 3 (EBIT-I) = EBIT
Or 3 (EBIT-200) = EBIT
Or 3 EBIT – 600 = EBIT
Or, 2 EBIT = 600
Or, EBIT = Rs. 300.

(ii) Calculation of sales

$$\text{Degree of Operating Leverage} = \frac{\text{Sales}-\text{V.Cost}}{\text{EBIT}}$$

$$\text{Or, } 5 = \frac{\text{S}-0.66\frac{2}{3}\ \text{S}}{300}$$

$$\text{Or, } 1500 = \text{S}-66\frac{2}{3}\ \text{S}$$

Or, Sales = Rs. 4500

Company B

(i) Calculation of EBIT

$$4 = \frac{\text{EBIT}}{\text{EBIT}-300}$$

Or, 4 (EBIT-300) = EBIT
Or, 4 EBIT - EBIT = Rs.1200
Or, EBIT = Rs. 400

(ii) Calculation of sales

$$6 = \frac{\text{S}-0.75.\text{S}}{400}$$

Or, S - 0.75. S = Rs. 2400
Or S = Rs. 9,000

Company C

(i) Calculation of EBIT

$$2 = \frac{\text{EBIT}}{\text{EBIT}-1000}$$

Or, 2 (EBIT-1000) = EBIT
Or, 2 EBIT - EBIT = Rs. 2000
Or, EBIT = Rs. 2,000

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(ii) Calculation of sales

$$2 = \frac{S - 0.50\ S}{2000}$$

Or, 4000 = S - 0.50 S

Or Sales = Rs. 8000

INCOME STATEMENT FOR A, B AND C COMPANIES

		A (Rs.)	B (Rs.)	C (Rs.)
(i)	Sales	4500	9600	8000
(ii)	*Less:* Variable Cost	3000	7200	4000
(iii)	Contribution	1,500	2,400	4,000
(iv)	*Less :* Fixed costs (iii-v)	1200	2000	2000
(v)	Operating Profit (EBIT)	300	400	2000
(vi)	Interest	200	300	1000
(vii)	Earnings Before Tax	100	100	1000
(viii)	*Less:* Tax (50%)	50	50	500
(ix)	Earnings After Tax (PAT)	50	50	500

Problem 16.13. Calculate operating leverage and financial leverage under situation A, B and C and financial Plans I, II and III respectively from the following information relating to the operation and capital structure of XYZ Co. Also find out the combinations of operating and financial leverage which give the highest value and the least value.

How are these calculations useful to financial manager in a company ?

Installed capacity	1200 units
Actual Production and Sales	800 units
Selling Price per unit	Rs. 15
Variable cost per unit	Rs.10
Fixed Costs: Situation A	Rs. 1,000
Situation B	Rs. 2,000
Situation C	Rs. 3,000
Capital Structure	

	Financial Plan		
	I	II	III
	Rs.	Rs.	Rs.
Equity	5,000	7,500	2,500
Debt	5,000	2,500	7,500
Cost of Debt 12%			

Solution :

CALCULATION OF OPERATING LEVERAGE

	Situation		
	A	B	C
Sales (800×15)	12,000	12,000	12,000
Less: Variable Cost (800×10)	8,000	8,000	8,000
Contribution	4,000	4,000	4,000
Less: Fixed Costs	1,000	2,000	3,000

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Operating Profit (EBIT)	3,000	2,000	1,000
Operating Leverage $\left(\frac{C}{EBIT}\right)$	4000	4000	4000
	3000	2000	1000
Or. O.L.	=1.33	2.00	4.00

CALCULATION OF FINANCIAL LEVERAGE

	Financial Plan		
Situation A :	*I*	*II*	*III*
	(Rs.)	*(Rs.)*	*(Rs.)*
Operating Profit	3,000	3,000	3,000
Less: Interest (12% on Debt)	600	300	900
Earningss Before Tax (PBT)	2,400	2,700	2,100
Financial Leverage $\left(\frac{EBIT}{PBT}\right)$	3000	3000	3000
	2400	2700	2100
Or, F.L.	=1.25	=1.11	=1.43
Situation B:			
Operating Profit (EBIT)	2000	2000	2000
Less: Interest (12% on Debt)	600	300	900
Earnings Before Tax (PBT)	1400	1700	1100
Financial Leverage $\left(\frac{EBIT}{PBT}\right)$	2000	2000	2000
	1400	1700	1100
	=1.43	=1.18	=1.82
Situation C:			
Operating Profit (EBIT)	1000	1000	1000
Less: Interest (12% on Debt)	600	300	900
Earnings Before Tax (PBT)	400	700	100
Financial Leverage $\left(\frac{EBIT}{PBT}\right)$	1000	1000	1000
	400	700	100
	=2.5	1.43	=10.0

Highest and Least Value of Combined Leverage

Combined Leverage = OL × FL

Highest Value = 4.0 × 10.0 = 40 Under situation C, Plan III

Least Value = 1.33 × 1.11 = 1.4763 Under situation A, Plan II

The calculation of leverages is useful to management for determining the total risk element of the company. The financial manager should make an effort to keep total risk at desired level. The earnings per share could also be increased by making use of leverages.

Problem 16.14. The following data are available for ABC Ltd. and XYZ Ltd. Companies :

	ABC Ltd.	XYZ Ltd.
Sales Volume	10,000 units	10,000 units
Selling Price per unit of output	Rs. 200	Rs. 200
Variable Cost per unit of output	Rs. 120	Rs. 150
Fixed Operating Cost per unit of output	Rs. 60	Rs. 30
Equity	Rs. 3,00,000	Rs. 6,00,000

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Preference shares	Rs. 1,00,000	——
Debt	Rs. 6,00,000	Rs. 4,00,000
Interest Rate on Debt	16.25%	15%
Dividend Rate on Preference Shares	13%	——
Tax Rate	35%	35%

Required :

(a) Calculate the Return on Equity (ROE)
Degree of Operating Leverage (DOL)
Degree of Financial Leverage (DFL)
Degree of Total Leverage (DTL), Operating break-even point, financial break-even point and overall break-even point for each company.

(b) As a financial analyst, which of the two companies you would describe more risky ? Give reasons.

Solution :

(a)

	ABC Ltd.	*XYZ Ltd.*
	Rs.	*Rs.*
Selling Price per unit	200	200
Less: Variable Cost per unit	120	150
Contribution per unit	80	50
Operating Fixed Cost (at sales volume of 10,000 units)	6,00,000 (10,000 × 60)	3,00,000 (10,000× 30)
Total Contribution (10,000 units)	8,00,000	5,00,000
Less : Operating Fixed Cost	6,00,000	3,00,000
Earnings Before Interest Tax (EBIT)	2,00,000	2,00,000
Less : Interest	97,500 (6,00,000×.1625	60,000 (4,00,000×.15
Earnings Before Tax (EBT)	1,02,500	1,40,000
Less : Tax at 35%	38,875	49,000
Earnings After Tax (EAT)	66,625	91,000
Less : Preference Dividend	13,000 (13% on Rs. 1,00,000)	— ——
Earnings available to equity shareholders	53,625	91,000
Number of Equity Shares	30,000	60,000
Earnings per share (EPS)	1.785	1.567
Return on Equity (ROE)	17.785%	15.167%
Degree of Operating Leverage (DOL) $= \frac{\text{Contribution}}{\text{EBIT}}$	4 times $\left(\frac{8,00,000}{2,00,000}\right)$	2.5 times $\left(\frac{5,00,000}{2,00,000}\right)$
Degree of Financial Leverage (DFL) $= \frac{\text{EBIT}}{\text{EBT} - \frac{\text{Preference Dividend}}{1-T}}$	$\frac{2,00,000}{1,02,500 - \frac{13,000}{1-.35}}$ $= \frac{2,00,000}{82,500}$	$= \frac{2,00,000}{1,40,000}$

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	=2.424 times	=1.4286 times
Degree of Total Leverage (DTL) DOL×DFL	4×2.424 =9.696 times	2.5×1.4286 =3.715
Operating Break - Even Point $= \frac{\text{Op. Fixed Cost}}{\text{Contribution per unit}}$	$= \frac{6,00,000}{80}$ = 7500 units	$= \frac{3,00,000}{50}$ = 6000 units
Financial Break-Even Point $= \frac{\text{Interest} + \frac{\text{Pref. Dividend}}{1=I}}{\text{Contribution per unit}}$	$= \frac{97,500+20,000}{80}$ =1468.75 units or 1469 units	$\frac{60,000}{50}$ 1200 units
Overall Break- Even Point $= \frac{\text{Op. Fixed Cost} + \text{Int.} + \frac{\text{Prof div.}}{1-T}}{\text{Contribution per unit}}$	8969 units	7200 units

(b) ABC Ltd. is exposed to more risk as compared to XYZ Ltd. The reasons for the same are that the Degree of Operating Leverage (DOL), Degree of Financial Leverage (DFL) and Degree of Total Leverage (DTL) are much higher in case of ABC Ltd. as compared to XYZ Ltd. The financial break-even point as well as operating break-even points also reflect the same. We may conclude that company XYZ Ltd. is better managed than ABC Ltd.

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17

Cash, Receivables and Inventory Management

Problem 17.1. Based on the following information prepare a cash Budget for ABC Ltd. :

	Ist Quarter (Rs.)	*2nd Quarter (Rs.)*	*3rd Quarter (Rs.)*	*4th Quarter (Rs.)*
Opening cash balance	10,000			
Collection from customers	1,25,000	1,50,000	1,60,000	2,21,000
Payments				
Purchase of materials	20,000	35,000	35,000	54,200
Other expenses	25,000	20,000	20,000	17,000
Salary and wages	90,000	95,000	95,000	1,09,200
Income tax	5,000	—	—	—
Purchase of machinery	—	—	—	20,000

The company desires to maintain a cash balance of Rs. 15,000 at the end of each quarter. Cash can be borrowed or repaid in multiples of Rs. 500 at an interest of 10% per annum. Management does not want to borrow cash more than what is necessary and wants to repay as early as possible. In any event, loans cannot be extended beyond four quarters. Interest is computed and paid when the principal is repaid. Assume that borrowings take place at the beginning and payments are made at the end of the quarters.

Solution :

CASH BUDGET FOR ABC LIMITED

	Particulars	*Ist Quarter (Rs.)*	*2nd Quarter (Rs.)*	*3rd Quarter (Rs.)*	*4th Quarter (Rs.)*
(a)	Receipts :				
	Opening Balance of Cash	10,000	15,000	15,000	15,325
	Collection from Debtors	1,25,000	1,50,000	1,60,000	2,21,000
	Cash Available	1,35,000	1,65,000	1,75,000	2,36,325
(b)	Payments :				
	Purchase of Materials	20,000	35,000	35,000	54,200
	Other Expenses	25,000	20,000	20,000	17,000
	Salary and Wages	90,000	95,000	95,000	1,09,200
	Income tax	5,000	—	—	—
	Purchase of Machinery	—	—	—	20,000
	Total Payment in cash	1,40,000	1,50,000	1,50,000	2,00,400
	Minimum Cash Balance Desired	15,000	15,000	15,000	15,000
	Total Cash Required	1,55,000	1,65,000	1,65,000	2,15,400

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(c)	Excess/(Deficit) [a–b]	(20,000)	—	10,000	20,925
(d)	Borrowings	20,000	—	—	
(e)	Repayments of Principal	—	—	(9,000)	(11,000)
(f)	Interest Payments	—	—	(675)[1]	(1100)[2]
		20,000	—	(9675)	(12,100)
(g)	Closing Balance of Cash	15,000	15,000	15,325	23,825

1. *Calculation of Interest :* $9{,}000 \times \frac{10}{100} \times \frac{9}{12} = 675$

(2) $11{,}000 \times \frac{10}{100} \times \frac{12}{12} = 1{,}100.$

Problem 17.2. Prepare cash budget for July-December from the following information :

(i) The estimated sales, expenses etc. are as follows :

(Rs. lakhs)

	June	*July*	*Aug.*	*Sept.*	*Oct.*	*Nov.*	*Dec.*
Sales	35	40	40	50	50	60	65
Purchases	14	16	17	20	20	25	28
Wages and Salaries	12	14	14	18	18	20	22
Misc. Expenses	5	6	6	6	7	7	7
Interest Received	2	—	—	2	—	—	2
Sale of Shares	—	—	20	—	—	—	—

(ii) 20% of the sales are on cash and the balance on credit.

(iii) 1% of the credit sales are returned by the customers. 2% of the total accounts receivable constitute bad debt losses. 50% of the good accounts receivable are collected in the month of the sales, and the rest in the next month.

(iv) The time lag in the payment of misc. expenses and purchases is one month. Wages and salaries are paid fortnighty with a time lag of 15 days.

(v) The company keeps a minimum cash balance of Rs. 5 lakhs. Cash in excess of Rs. 7 lakhs is invested in Govt. securities in the multiple of Rs. 1 lakh. Shortfalls in the minimum cash balance are made good by borrowings from banks. Ignore interest received and paid.

Solution :

CALCULATION OF COLLECTION FROM DEBTORS

(Rs. Lakhs)

	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Sales	35.00	40.00	40.00	50.00	50,00	60.00	65.00
Cash Sales (20%)	7.00	8.00	8.00	10.00	10.00	12.00	13.00
Credit Sales (80%)	28.00	32.00	32.00	40.00	40.00	48.00	52.00
Sales Returns (1%)	0.28	0.32	0.32	0.40	0.40	0.48	0.52
Bad Debts (assumed to be on gross credit sales at 2%)	0.56	0.64	0.64	0.80	0.80	0.96	1.04
Good Accounts Receivable	27.16	31.04	31.04	38.80	38.80	46.56	50.44
Collection in the month of sales (50%)	13.58	15.52	15.52	19.40	19.40	23.28	25.22
Collection in the next month (50% of previous month)	—	13.58	15.52	15.52	19.40	19.40	23.28
Total Collection	13.58	29.10	31.04	34.92	38.80	42.68	48.50

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CALCULATION OF PAYMENT OF WAGES AND SALARIES

	July	*Aug.*	*Sept.*	*Oct.*	*Nov.*	*Dec.*
1/2 of Previous Month	6.00	7.00	7.00	9.00	9.00	10.00
1/2 of Same Month	7.00	7.00	9.00	9.00	10.00	11.00
Total Payment	13.00	14.00	16.00	18.00	19.00	21.00

CASH BUDGET FOR JULY–DECEMBER

(Rs. in Lakhs)

	Particulars	*July*	*Aug.*	*Sept.*	*Oct.*	*Nov.*	*Dec.*
(a)	Receipts :						
	Opening Balance of Cash	5.00	7.10	7.14	7.06	7.86	7.54
	Cash Sales	8.00	8.00	10.00	10.00	12.00	13.00
	Collection from Debtors	29.10	31.04	34.92	38.80	42.68	48.50
	Interest Received	—	—	2.00	—	—	2.00
	Sale of Shares	—	20.00	—	—	—	—
	Cash available	42.10	66.14	54.06	55.86	62.54	71.04
(b)	Payments :						
	Creditor for Purchases (Time lag one month)	14.00	16.00	17.00	20.00	20.00	25.00
	Wages and Salaries	13.00	14.00	16.00	18.00	19.00	21.00
	Misc. Expenses (Time lag one month)	5.00	6.00	6.00	6.00	7.00	7.00
	Total Payments	32.00	36.00	39.00	44.00	46.00	53.00
	Minimum Cash Balance Required	5.00	5.00	5.00	5.00	5.00	5.00
	Total Cash Required	37.00	41.00	44.00	49.00	51.00	58.00
(c)	Excess/(Deficit) [a–b]	5.10	25.14	10.06	6.86	11.54	13.04
(d)	Borrowings	—	—	—	—	—	—
(e)	Investments in Govt. Securities (In excess of Rs. 7 lakhs)	(3.00)	23.00)	(8.00)	(4.00)	(9.00)	(11.00)
(f)	Closing Balance of Cash	7.10	7.14	7.06	7.86	7.54	7.04

Problem 17.3. As a part of the strategy to increase sales and profits, the sales manager of a company proposes to sell goods to a group of new customers with 10% risk of non-payment. This group would require one and a half months credit and is likely to increase sales by Rs. 1,00,000 p.a. Production and selling expenses amount to 80% of sales and the income-tax rate is 5%. The company's minimum required rate of return (after tax) is 25%.

(a) Should the sales manager's proposal be accepted ?

(b) Also find the degree of risk of non-payment that the company should be willing to assume if the required rate of return (after tax) were *(i)* 30%, *(ii)* 40% and *(iii)* 60%

Solution :

(a) Proposal to extend credit to a group of new customers :

(i) Calculation of additional profit

	(Rs.)
Increase in Sales	1,00,000
Less : Bad Debts (10% of sales)	10,000
	90,000
Less : Production and Selling Expenses (80% of sales)	80,000

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Profit Before Tax	10,000
Less : Tax at 50%	5,000
Profit After Tax	5,000

(ii) Average additional investment in debtors :

$$\text{Credit Period} = 1\frac{1}{2} \text{ month}$$

$$\text{Average amount of additional debtors} = \frac{\text{Sales}}{12} \times \text{No. of months}$$

$$= \frac{1,00,000}{12} \times \frac{3}{2}$$

$$= \text{Rs. } 12,500.$$

$$\text{Investment/Amount blocked in addtional debtors} = \text{Rs. } 12,500 \times \frac{80}{100}$$

$$= \text{Rs. } 10,000.$$

(iii) Calculation of Rate of Return :

$$\text{Rate of Return} = \frac{\text{PAT}}{\text{Investment}} \times 100$$

$$= \frac{5,000}{10,000} \times 100 = 50\%$$

As the rate of return on addtional investment in debtors is 50%, which is more than the required rate of return (after-tax) of 25%, the sales manager's proposal should be accepted.

(b) COMPUTATION OF DEGREE OF RISK OF NON-PAYMENT

	Required Rate of Return		
	30%	*40%*	*60%*
	(Rs.)	*(Rs.)*	*(Rs.)*
Required amount of after tax profit on additional investment of Rs. 10,000	3,000	4,000	6,000
Required amount of before tax Profit	$3,000 \times \frac{100}{50}$	$4,000 \times \frac{100}{50}$	$6,000 \times \frac{100}{50}$
	= 6,000	= 8,000	= 12,000
Production and Selling Expenses (80% of sales)	80,000	80,000	80,000
Minimu Sales Revenue Required	86,000	88,000	92,000
Sales Revenue	1,00,000	1,00,000	1,00,000
Maximum permissible bad debts	14,000	12,000	8,000
Degree of Risk of Non-payment	$\frac{14,000}{1,00,000} \times 100$	$\frac{12,000}{1,00,000} \times 100$	$\frac{8,000}{1,00,000} \times 100$
	= 14%	=12%	=8%

Problem 17.4. Star Limited, manufacturers of Colour TV sets, are considering the liberalisation of existing credit terms to three of their large customers A, B and C. The credit period and likely quantity of TV sets that will be lifted by the customers are as follows :–

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Credit Period (Days)	*(Quantity Lifted (No. of TV Sets)* A	B	C
0	1,000	1,000	—
30	1,000	1,500	—
60	1,000	2,000	1,000
90	1,000	2,500	1,500

The selling price per TV set is Rs. 9,000. The expected contribution is 20% of the selling price. The cost of carrying debtors averages 20% per annum.

You are required to determine the credit period to be allowed to each customer. (Assume 360 days in a year for calculation purposes)

Solution :

(i) Customer A :

As there is no increase in sales with increase in credit period to customer A, Credit should not be allowed to him.

(ii) **PROFITABILITY STATEMENT FOR CUSTOMERS B AND C**

		Customer B				*Customer C*			
(i)	Credit Period (Days)	0	30	60	90	0	30	60	90
(ii)	Sales (Units)	1,000	1,500	2,000	2,500	—	—	1,000	1,500
(iii)	Sales Revenue (Rs. lakhs) at Rs. 9,000 each	90	135	180	225	—	—	90	135
(iv)	Contribution (20% of Sales)	18	27	36	45	—	—	18	27
(v)	Debtors $\left(\frac{\text{Sales} \times \text{Credit Period}}{360}\right)$	—	11.25	30.00	56.25	—	—	15.00	33.75
(vi)	Investment in debtors at cost (80%)	—	9.00	24.00	45.00	—	—	12.00	27.00
(vii)	Cost of carrying debtors (20% p.a.)	—	1.80	4.80	9.00	—	—	2.40	5.40
(viii)	Net Contribution (iv – vii)	18.00	25.20	31.20	36.00	—	—	15.60	21.60

As the net contribution is maximum, Rs. 36 lakhs in case of customer B and Rs. 21.60 lakhs in case of customer C, when credit is allowed for 90 days, therefore credit of 90 days should be allowed to both B and C.

Problem 17.5. A company currently has an annual turnover of Rs. 10 lakhs and an average collection period of 45 days. The company wants to experiment with a more liberal credit policy on the ground that increase in collection period will generate additional sales. From the following information, kindly indicate which of the policies you would like the company to adopt :

Credit Policy	*Increase in Collection Period*	*Increase in Sales Rs.*	*Percentage of Default*
1	15 days	50,000	2%
2	30 days	80,000	3%
3	40 days	1,00,000	4%
4	60 days	1,25,000	6%

The selling price of the product is Rs. 5, average cost per unit at current level is Rs. 4 and the variable cost per unit is Rs. 3.

The current bad debts loss is 1% and the required rate of return on investment is 20%. A year can be taken to comprise of 360 days.

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Solution :

STATEMENT OF EVALUATION OF CREDIT POLICIES

	Existing Policy	*Proposed Policies*			
		(1)	*(2)*	*(3)*	*(4)*
	45 Days (Rs.)	*60 Days (Rs.)*	*75 Days (Rs.)*	*85 Days (Rs.)*	*105 Days (Rs.)*
(A) *Calculation of additional Contribution from increase in sales :*					
(1) Sales Revenue	10,00,000	10,50,000	10,80,000	11,00,000	11,25,000
(2) Increase in Sales Revenue	—	50,000	80,000	1,00,000	1,25,000
(3) Increase in Contribution $\left(\frac{S-V}{S} \times 100 = \frac{5-3}{5} \times 100 = 40\%\right)$	—	20,000	32,000	40,000	50,000
(4) Bad Debts (Sales x % age Default)	10,000	21,000	32,400	44,000	67,500
(5) Increase in Bad Debts	—	11,000	22,400	34,000	57,500
(6) Excess Contribution (Increase in Contribution (3) – Increase in Bad Debts (5)]	—	9,000	9,600	6,000	–7,500
(B) Calculation of Cost of Carrying additional receivables :					
(7) Average Receivables $\left(\frac{\text{Sales} \times \text{Credit Period}}{360}\right)$	1,25,000	1,75,000	2,25,000	2,59,722	3,28,125
(8) Investment in Receivables at Variable Cost $\left(\text{Receivables} \times \frac{\text{V.C.}}{\text{S.P.}}\right)$	75,000	1,05,000	1,35,000	1,55,833	1,96,875
(9) Increase in Investment	—	30,000	60,000	80,833	1,21,875
(10) Required Return on Additional Investment (20%)	—	6,000	12,000	16,167	24,375
(C) Excess of additional Contribution over required return on additional investment (6 – 10)	—	3,000	–24,00	–10,167	–31,875

As there is positive excess of additional contribution over required return on additional investment only under credit policy 1, hence the company should adopt proposed policy 1 of extending credit by 15 days, i.e. credit upto 60 days.

Problem 17.6. A manufacturing company uses Rs. 1,00,000 materials per year. The administration cost per purchase is Rs. 100, and carrying cost is 20% of the average inventory. Calculate Economic Order Quantity for the company.

Solution :

$$\text{Economic Order Quantity (E.O.Q.)} = \frac{\sqrt{2\,CO}}{I}$$

C = Annual requirement of material *i.e.*, Rs. 1,00,000

O = Ordering Cost or administration cost *i.e.*, Rs. 100

I = Carrying Cost *i.e.* 20%

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$$\text{E.O.Q.} = \sqrt{\frac{2 \times 1,00,000 \times 100}{\frac{20}{100}}}$$

$$= \frac{\sqrt{2 \times 1,00,000 \times 100 \times 100}}{20}$$

$$= \text{Rs. } 10,000$$

Problem 17.7. A manufacturer buys certain equipment from outside suppliers at Rs. 30 per unit. Total annual needs are 800 units. The following further data are available :

Annual return on investment, 10%

Rent, insurance, taxes per unit per year, Re. 1

Cost of placing an order, Rs. 100.

Determine the economic order quantity.

Solution :

$$\text{EOQ} = \sqrt{\frac{2CO}{I}}$$

where C = Annual requirement of material *i.e.,* 800 units.

O = Ordering Cost *i.e.,* Rs. 100.

I = Carrying Cost per unit *i.e.,* Re. 1 + 10% Rs. 30 (cost per unit) = 4.

$$\text{EOQ} = \sqrt{\frac{2 \times 800 \times 100}{4}} = 200 \text{ units}$$

Problem 17.8. Find out the Economic Order Quantity and Other Schedule for raw materials and packing materials with the following data given to you :

1. Cost of Ordering : Raw material : Rs. 1,000 per order
   Packaging material : Rs. 5,000 per order
2. Cost of holding inventory : Raw material : 1 P. per unit p.m.
   Packaging material : 5 P. per unit p.m.
3. Production rate : 2,00,000 units per month.

(Company Secretaries Final)

Solution :

$$\text{Economic Order Quantity} = \sqrt{\frac{2\,CO}{I}}$$

C = Units consumed in 2 months

O = Cost per order

I = Cost of holding inventory per month

$$\text{E.O.Q. for Raw material} = \frac{\sqrt{2 \times 2,00,000 \times 1,000}}{1 \text{ P.}}$$

$$= \sqrt{\frac{2 \times 2,00,000 \times 1,000 \times 100}{1}}$$

$$= \sqrt{4,00,00,00,00,00}$$

$$= 2,00,000 \text{ units}$$

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Monthly requirement of materials is 2,00,000 units and economic order quantity is also 2,00,000 units ; so one order of 2,00,000 units will be sufficient for one month.

$$\text{E.O.Q. for Packaging Materials} = \sqrt{\frac{2\,CO}{1}}$$

$$= \frac{\sqrt{2 \times 2,00,000 \times 5,000}}{5P.}$$

$$= \sqrt{\frac{2 \times 2,00,000 \times 5,000 \times 100}{5}}$$

$$= \sqrt{4,00,00,00,00,00}$$

$$= 2,00,000 \text{ units}$$

Monthly requirement of packaging material is 2,00,000 units Economic Order Quantity for packaging materials is 2,00,000 units.

Therefore, one order of 2,00,000 units will be sufficient to meet monthly requirements for packaging material.

Problem 17.9. What do you understand by maximum level, minimum level, re-ordering level ? Calculate the above from the following data :—

Re-order quantity	1,500 units
Re-order period	4 to 6 weeks
Maximum consumption	400 units per week
Normal consumption	300 units per week
Minimum consumption	250 units per week.

Solution :

(a) Re-ordering Level = Maximum Consumption × Maximum Re-order Period
= 400 units × 6
= 2,400 units

(b) Maximum Level = Re-ordering Level + Re-ordering quantity - (Minimum Consumption × Minimum Re-order Period)
= 2,400 units + 1,500 units-(250 unit × 4 weeks)
= 2,900 units

(c) Minimum Level = Re-ordering Level-(Normal Consumption × Normal Re-order Period)
= 2,400 units-(300 units × 5 weeks)
= 900 units.

Working Note :

$$\text{Normal Re–order Period} = \frac{\text{Minimum Period} + \text{Maximum Period}}{2}$$

$$= \frac{4 \text{ weeks} + 6 \text{ weeks}}{2}$$

$$= 5 \text{ weeks}$$

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Problem 17.10. Two materials, X and Y are used as follows :
Minimum usage-50 units per week each ;
Maximum usage-150 units per week each ;
Normal usage-100 units per week each ;
Ordering quantity : X-600 units and Y-1,000 units ;
Delivery period : X-4 to 6 weeks ;
Y-2 to 4 weeks.
Calculate for each material :
(a) Minimum Level, *(b)* Maximum Level *(c)* Ordering Level.

Solution :

Ordering level should be calculated first

(a) Ordering level = Maximum usage × Mininum Re-order Period
Ordering level for material X = 150 units × 6 Weeks = 900 units
Ordering level for material Y = 150 units × 4 Weeks = 600 units

(b) Minimum level = Ordering level – (Normal usage × Normal Order Period)
Material X = 900 units – (100 units × 5 Weeks) = 400 units
Material Y = 600 units – (100 units × 3 Weeks) = 300 units

$$\text{Normal period for Material X} = \frac{4 \text{ Weeks} + 6 \text{ Weeks}}{2}$$
$$= 5 \text{ Weeks}$$
$$\text{Normal period for Material Y} = \frac{2 \text{ Weeks} + 4 \text{ Weeks}}{2}$$
$$= 3 \text{ Weeks}$$

(c) Maximum level = Re-ordering Level + Ordering Quantity)–
(Minimum usage × Minimum order period)
Material X = 900 units + 600 units – (50 units × 4)
= 1,300 units
Material Y = 600 units + 1,000 units – (50 units × 2)
= 1,500 units.

Problem 17.11. The following information is available in repect of component 020 :
Maximum stock level : 8,400 units
Budgeted Consumption : Maximum 1,500 units per month
Minimum 800 units per month
Estimated delivery period : Maximum 4 months
Minimum 2 months

You are required to calculate :
(i) Re-order level
(ii) Re-order quantity. *[I.C.M.A–Inter]*

Solution :

(i) Re-order level = Maximum consumption × Maximum Re-order period
= 1,500 units × 4 months
= 6,000 units

(ii) Re-order quantity = Maximum stock level – Re-order level
+ (Minimum consumption × Minimum Re-order period)
= 8,400 units – 6,000 units + (+ 800 units × 2 months)
= 4,000 units.

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Problem 17.12. Easy Limited specialises in the manufacture of a computer component. The component is currently sold for Rs. 1,000 and its variable cost is Rs. 800. For the year ended 31.12.92 the company sold on an average 400 components per month.

At present the company grants one month credit to its customers. The company is thinking of extending the same to two months on account of which the following is expected :

Increase in Sales 25%
Increase in Stock Rs. 2,00,000
Increase in Creditors Rs. 1,00,000

You are required :

To advise the company on whether or not to extend the credit terms if :

(a) all customers avail the extended credit period of two months and

(b) existing customers do not avail the credit terms but only the new customers avail the same. Assume in this case the entire increase in sales is attributable to the new customers.

The company expects a minimum return of 40% on the investment.

Solution :

COMPARATIVE ANALYSIS OF CREDIT TERMS

		All Customers avail the credit of two months months (Rs.)	*Only the new customers avail the credit of two months (Rs.)*
(A)	Increase in Contribution from additional sales :		
	Present Sales Revenue (1000 × 400 × 12)	4,8,00,000	48,00,000
	Increase in sales (25%)	12.00.000	12.00.000
	Proposed Sales Revenue	60.00.000	60.00.000
	Contribution from additional sales $\left(12{,}00{,}000 \times \frac{1000 - 800}{1000}\right)$	2.40.000	2.40.000
(B)	Cost of carrying additional receivables and stock		
	Additional Debtors $\left(60{,}00{,}000 \times \frac{2}{12}\right)$ and $\left(12{,}00{,}000 \times \frac{2}{12}\right)$	10,00,000	2,00,000
	Less : Existing Debtors (48,00,000 × 1/12)	4.00.000	—
	Increase in Debtors	6.00.000	2.00.000
	Investment in additional debtors at variable cost, *i.e.* 80%	4,80,000	1,60,000
	Increase in stock	2.00.000	2.00.000
		6,80,000	3,60,000
	Less : Increase in creditors	1.00.000	1.00.000
	Total additional investment	5.80.000	2.60.000
	Cost of additional investment (40%)	2.32.000	1.04.000
	Excess of Profit/Contribution over cost (1–2)	8,000	1,36,000

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It is clear from the above analysis that it is profitable for the company to extend credit period in both the cases. However the profit will be more in case only new customers avail the extended credit period.

Problem 17.13. Following information is available for purchase and issue of materials :

1996		
Jan., 4	Purchased	5,000 units @ Rs. 4.00 per unit
Jan., 15	Purchased	1,000 units @ Rs. 4.80 per unit
Jan., 20	Issued	3,000 units
Feb., 10	Purchased	2,000 units @ Rs. 5 per unit
Feb., 13	Issued	2,500 units
Feb., 28	Purchased	6,000 units @ Rs. 5.20 per unit
March 10	Purchased	1,500 units @ Rs. 5.50 per unit
March 15	Issued	4,000 units
March 20	Issued	3,000 units
March 28	Purchased	2,400 units @ Rs. 5.70 per unit

From the information given above, prepare the stores ledger by *(i)* FIFO and LIFO methods of charging issue of materials.

Solution :

(1) **STORES LEDGER FIFO-METHOD**

		Receipts			*Issues*			*Balance*	
Date	*Particulars*	*Qty. Units*	*Rate*	*Amt.*	*Qty. Units*	*Rate*	*Amt.*	*Qty. Units*	*Amt.*
1996			*Rs.*	*Rs.*		*Rs.*	*Rs.*		*Rs.*
Jan. 4	Purchase : order No.	5,000	4.00	20,000				5,000	20,000
Jan., 15	Purchase : order No.	1,000	4.80	4,800				6,000	24,800
Jan., 20	Issue : Requisition slip No.				3,000	4.00	12,000	3,000	12,800
Feb. 10	Purchase : order No.	2,000	5.00	10,000				5,000	22,800
Feb., 13	Issue : Requisition ship No.				2,500	2,000 @ 4 500 @ 4.80	10,400	2,500	12,400
Feb. 28	Purchase : order No.	6,000	5.20	31,200				8,500	43,600
Mar. 10	Purchase : order No.	1,500	5.50	8,250				10,000	51,850
Mar. 15	Issue : Requisition slip No.				4,000	500 @ 4.80 2,000 @ 5.00 1,500 @ 5.20	20,200	6,000	31.650
Mar. 20	Issue : Requisition slip No.				3,000	5.20	16,500	3,000	16,050
Mar. 28	Purchase order No.	2,400	5.70	13,680				5,400	29,730

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Closing stock consists of the following :

1,500 @ 5.20	7,800
1,500 @ 5.50	8,250
2,400 @ 5.70	13,680
	29,730

STORES LEDGER FIFO-METHOD

		Receipts			Issues			Balance	
Date	*Particulars*	*Qty. Units*	*Rate*	*Amt.*	*Qty. Units*	*Rate*	*Amt.*	*Qty. Units*	*Amt.*
1996			*Rs.*	*Rs.*		*Rs.*	*Rs.*		*Rs.*
Jan. 4	Purchase : order No...	5,000	4.00	20,000				5,000	20,000
Jan. 15	Purchase : order No...	1,000	4.80	4,800				6,000	24,800
Jan., 20	Issue : Requisition slip No. ...				3,000	1,000 @ 4.80 2,000 @ 4.00	12,800	3,000	12,000
Feb. 10	Purchase : order No. ...	2,000	5.00	10,000				5,000	22,000
Feb., 13	Issue : Requisition slip No. ...				2,500	2,000 @ 5.00 500 @ 4.00	12,000	2,500	10,000
Feb., 28	Purchase : order No. ...	6,000	5.20	31,200				8,500	41,200
Mar. 10	Purchase : order No....	1,500	5.50	8,250				10,000	49,450
Mar. 15	Issue : Requisition slip No. ...				4,000	1,500 @ 5,50 2,500 @ 5.20	21,250	6,000	28,200
Mar., 20	Issue : Requisition slip No. ...				3,000	5.20	15,600	3,000	12,600
Mar. 28	Purchase : order No. ...	2,400	5,70	13,680				5,400	26,280

Closing stock consists of the following materials :

	Rs.
2,500 @ 4.00	10,000
500 @ 5.20	2,600
2,400 @ 5.70	13,680
	26,280

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Problem 17.14. The following transactions took place in respect of material B. 25.

	Receipts		*Issues*
	Units	*Rate (Rs. P.)*	*(Units)*
1.3.96	500	1.00	
15.3.96	700	1.10	
17.3.96			600
19.3.96	400	120	—
21.3.96	300	1.25	300
27.3.96	—	—	—
31.3.96	—	—	800

Prepare a stores ledger account using :
(a) Simple Average Method and
(b) Weighted Average Method.

Solution :

(a) Simple Average Method

STORES LEDGER ACCOUNT (MATERIAL B. 25)

Date	*Particulars*	*Receipts*			*Issues*			*Balance*		
		Qty. Units	*Rate*	*Amt.*	*Qty. Units*	*Rate*	*Amt.*	*Qty. Units*	*Amt.*	
			Rs.	*Rs.*		*Rs.*	*Rs.*			*Rs.*
1.3.96	Purchase	500	1.00	500				500	500	
15.3.96	Purchase	700	1.10	770				1,200	1,270	
17.3.96	Issue				600	1.05	630	600	670	
19.4.96	Purchase	400	1.20	480				1,000	1,150	
21.3.96	Issue				300	1.15	345	700	805	
27.3.96	Purchase	300	1.25	375				1,000	1,180	
31.3.96	Issue				800	1.183	946.40	200	233.60	

Working Notes :

Issues have been priced as follows :

17.3.96 $\frac{1.00 + 1.10}{2} = 1.05$

21.3.96 $\frac{1.10 + 1.20}{2} = 1.15$ (since units purchased on 1.3.96 have been issued fully)

31.3.96 $\frac{1.10 + 1.20 + 1.25}{3} = 1.183$

(b) Weighted Average Method

STORES LEDGER ACCOUNT (MATERIAL B. 25)

Date	*Particulars*	*Receipts*			*Issues*			*Balance*		
		Qty Units	*Rate*	*Amt.*	*Qty. Units*	*Rate*	*Amt.*	*Qty. Units*	*Amt.*	*Rate*
			Rs.	*Rs.*		*Rs.*	*Rs.*		*Rs.*	*Rs.*
1.3.96	Purchase	500	1.00	500				500	500	
15.3.96	Purchase	700	1.10	770				1,200	1,270	1.085
17.3.96	Issue				600	1.058	634.80	600	635.20	
19.3.96	Purchase	400	1.20	480				1000	1115.20	1.115
21.3.96	Issue				300	1.115	334.50	700	780.70	
27.3.86	Purchase	300	1.25	375				1000	155.70	1.155
31.3.96	Issue				800	1.156	924.80	200	230.90	

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Problem 17.15. Following transactions occur in the purchase and issue of a material in January, 1996.

			Units	*Price*
January	1	Balance b/f	300	2.00
January	2	Purchase	100	1.50
January	5	Issue	100	
January	9	Purchase	240	2.10
January	12	Issue	200	
January	20	Purchase	300	2.20
January	24	Issue	260	
January	28	Purchase	150	2.30

Prepare Stores Ledger Account by using :

(i) Simple Average Method

(ii) Weighted Average Method.

STORES LEDGER ACCOUNT
(i) Simple Average Method

Solution :

Date	*Particulars*	*Receipt*			*Issue*			*Balance*	
		Qty. units	*Rate per unit*	*Amount*	*Qty. units*	*Rate per unit*	*Amount*	*Qty. units*	*Amount*
1996									
Jan. 1	Balance B/F							300	600
Jan. 2	Purchase Order No. ...	100	1.50	150				400	750
Jan. 5	Issue Requisition slip No. ...				100	$\frac{2 + 1.50}{2}$ = 1.75	175	300	575
Jan. 9	Purchase Order No. ...	250	2.10	525				550	800
Jan. 12	Issue : Requisition slip No. ...				200	$\frac{2 + 1.50 + 2.10}{3}$ = 1.867	377.40	350	422.60
Jan. 20	Purchase Order No. ...	300	2.20	660				650	1082.60
Jan. 24	Issue : Requisition slip No. ...				260	$\frac{1.50 + 2.10 + 2.20}{3}$ = 1.933	502.80	350	579.80
Jan. 28	Purchase Order No. ...	150	2.30	345				540	924.80

STORES LEDGER ACCOUNT
(ii) Weighted Average Method

Solution :

Date	*Particulars*	*Receipt*			*Issue*			*Balance*		
		Qty. units	*Rate per unit*	*Amount*	*Qty. (unit)*	*Rate per unit*	*Amount*	*Qty. (units)*	*Amount*	*Rate*
1996										
Jan. 1	Balance B/F							300	600	2.00
Jan. 2	Purchase Order No....	100	1.50	150				400	750	1.875
Jan. 5	Issue : Requisition slip No. ...				100	1.875	187.50	300	562.50	

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Jan. 9	Purchase Order No. ...	250	2.10	525				550	1087.50	1.977
Jan. 12	Issue : Requitision slip No. ...				200	1.977	395.40	350	737.10	
Jan. 20	Purchase Order No. ...	300	2.20	660				650	1397.10	2.149
Jan. 24	Issue : Requitision slip No. ...				260	2.149	558.74	390	838.36	
Jan. 28	Purchase Order No. ...	150	2.30	345				540	1183.36	2.191

Problem 17.16. The stock of material A as on 1st July 1996 is 500 units at Re 1 per unit. Following Purchases and issues of this item were made subsequently.

Date	*Receipts Qty. Units*	*Rate Rs. P*	*Issue Qty. units*
July 5			100
July 12	500	1.20	
July 15	300	1.30	
July 20			400
July 22			200
July 25	600	1.40	
July 31			300

Prepare a Store Ledger Account showing how the value of the above issue be arrived under the Base Stock Method when it operates with *(i)* FIFOand *(iii)* LIFO Method. Base stock is 300 units.

Solution :

STORES LEDGER

(i) Base Stock Method Alongwith FIFO Method

Base Stock : 30 units

Date 1996	*Particulars*	*Receipts*			*Issues*			*Balance*	
		Qty. Units	*Rate Rs.*	*Amt. Rs.*	*Qty. Units*	*Rate Rs.*	*Amt. Rs.*	*Qty. Units*	*Amt. Rs.*
July 1	Balance							500	500
July 5	Issue				100	1.00	100	400	400
July 12	Receipt	500	1.20	600				900	1,000
July 15	Receipt	300	1.30	390				1,200	1,390
July 20	Issue				400	100 @ 1.00	460	800	930
						300 @ 1.20			
July 22	Issue				200	1.20	240	600	690
July 25	Purchase	600	1.40	840				1,200	1,530
July 31	Issue				300	1.30	390	900	1,140

Rs.

Note : Closing stock consists of the following :

July 1 300 units @ 1.00 = 300

July 25 600 units @ 1.40 = 840

Rs. 1140

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STORES LEDGER
(i) Base Stock Method Alongwith FIFO Method

Base Stock : 300 units

Date 1996	*Particulars*	*Receipts*			*Issues*			*Balance*	
		Qty. Units	*Rate Rs.*	*Amt. Rs.*	*Qty. Units*	*Rate Rs.*	*Amt. Rs.*	*Qty. Units*	*Amt. Rs.*
July 1	Balance							500	500
July 5	Issue				100	1.00	100	400	400
July 12	Purchase	500	1.20	600				900	1,000
July 15	Purchase	300	1.30	390				1,200	1,390
July 20	Issue				400	300 @ 1.30			
							510	800	880
						100 @ 1.20			
July 22	Issue				200	1.20	240	600	640
July 25	Purchase	600	1.40	840				1,200	1,480
July 31	Issue				300	1.40	420	900	1,060

Note : Closing stock consists of the following :

		Rs.
July 1	400 units @ Re. 1	= 400
July 12	200 units @ Rs. 1.20	= 240
July 25	300 units @ Rs. 1.40	= 420
		Rs. 1,060

Problem 17.17. The standard price of a material is fixed at Rs. 5 per unit. Prepare the Stores Ledger Account by using the following information :

Date 1995	*Receipts* Qty. (units)	*Receipts* Rate (Rs.)	*Issues* Qty. Units
January 1	4,000	5.25	
January 5	2,000	5.30	
January 10			3,000
January 12	8,000	5.00	
January 15			7,000
January 25			2,000
January 29	5,000	4.80	
January 30	2,000	5.50	
January 31			2,500

Solution :

STORES LEDGER ACCOUNT
Standard Price Method

Date 1996	*Particulars*	*Receipts*			*Issues*			*Balance*	
		Qty. Units	*Rate Rs.*	*Amt. Rs.*	*Qty. Units*	*Rate Rs.*	*Amt. Rs.*	*Qty. Units*	*Amt. Rs.*
Jan. 1	Purchase	4,000	5.25	21,000				4,000	21,000
Jan. 5	Purchase	2,000	5.30	10,600				6,000	31,600

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Jan. 10	Issue				3,000	5.00	15,000	3,000	16,600
Jan. 12	Purchase	8,000	5.00	40,000				11,000	56,600
Jan. 15	Issue				7,000	5.00	35,000	4,000	21,600
Jan. 25	Issue				2,000	5.00	10,000	2,000	11,600
Jan. 29	Purchase	5,000	4,80	24,000				7,000	35,600
Jan. 30	Purchase	2,000	5.50	11,000				9,000	46,600
Jan. 31	Issue				2,500	5.00	12,500	6,500	34,100

Problem 17.18. At the beginning of October 1995, Quality Brush Company had in stock 10,000 brushes valued at Rs. 10 each. Further purchases were made during the month as follows :–

7th October 4,000 Brushes @ Rs. 12.50
14th October 6,000 Brushes @ Rs. 15.50
24th October 8,000 Brushes @ Rs. 16.50
Issues to shop floor were as follows :
16th October 16,000 Brushes
28th October 10,000 Brushes
You are required :

(a) to prepare a stores ledger card for the month of October on the assumption that materials were issued on First-in-First-out principle, and

(b) to state the value of closing stock at the end of October if issues re priced at the weighted average method.

Solution :

Material : Brushes

STORES LEDGER CARD

FIFO Method

Date 1995	*Particulars*	*Receipts*			*Issues*			*Balance*	
		Qty. Units	*Rate*	*Amt. Rs.*	*Qty.*	*Rate Units*	*Amt. Rs.*	*Qty. Units*	*Amt. Rs.*
Oct., 1	Balance b/d							10,000	1,00,000
Oct., 7	Receipts : Order No. …	4,000	12.50	50,000				14,000	1,50,000
Oct., 14	Receipt : Order No. …	6,000	15.00	90,000				20,000	2,40,000
Oct., 16	Issue : Requisition slip No. …				16,000	10,000 @ 10.00 4,000 @ 12,50 2,000 @ 15.00	1,80,000	4,000	60,000
Oct., 24	Receipt : Order No. …	8,000	16.50	1,32,000				12,000	1,92,000
Oct., 28	Issue : Requisition slip No. …				10,000	4,000 @ 15,000 6,000 @ 16.50	1,50,000	2,000	33,000

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Note : Closing stock consists of the following materials :
Oct., 24, 2,000 units @ 16.50 = Rs. 33,000

(b) When material issues are priced at Weighted Average Price Method, then the value of closing stock will be as follows :

		Rs.	*Rs.*
Oct. 1	Opening Balance		
	10,000 units @ Rs. 10	1,00,000	
Oct. 7	Receipt of 4,000 units		
	@ Rs. 12.50	50,000	
Oct. 14	Receipt of 6,000 units	90,000	
	@ Rs. 15		2,40,000
Oct. 16	*Less :* Issue of 16,000 units		
	@ Rs. 12		1,92,000
	$\left(\frac{2,40,000}{26,000} \times 16,000\right)$		
	Balance : 4,000 units		
	(20,000 – 16,000)		48,000
Oct. 24	Receipt of 8,000 units		
	@ 16.50	1,32,000	1,32,000
	Balance : Value of 12,000 units		1,80,000
Oct. 28	*Less :* Issue of 10,000 units		
	@ 15		
	$\left(\frac{1,80,000}{12,000} \times 10,000\right)$		1,50,000
	Value of closing stock,		
	2,000 units		30,000

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18

Dividend Policy

Problem 18.1. The Absestors Company belongs to a risk class of which the appropriate capitalisation rate is 10%. It currently has 1,00,000 shares selling at Rs. 100 each. The firm is contemplating the declaratioin of a Rs. 6 dividend at the end of the current fiscal year, which has just begun. Answer the following questions based on the MM model and the assumption of no taxes.

(i) dividend is not declared ; and the assumption of no taxes :

(a) what will be the price of the shares at the end of the year if *(i)* dividend is not declared ; and *(ii)* if it is declared ?

(b) assuming that the firm pays dividend, has net income of Rs. 10,00,000 and makes new investment of Rs. 20,00,000 during the period, how new shares must be issued ? *(M. Com., Delhi)*

Solution :

(a) (i) Price of the share, when dividend is not declared :

$$P_0 = \frac{P_1 + D_1}{(1 + k_e)}$$

or, $P_1 = P_0 (1 + k_e) - D_1$

$= 100 (1 + .10) - 0$

$=$ Rs. 110

(ii) Price of the share when dividend is declared :

$P_1 = P_0 (1 + k_e) - D_1$

$= 100 (1 + .10) - 6$

$= 110 - 6$

$=$ Rs. 104

(b) Number of shares to be issued :

$$m = \frac{I - (E - nD_1)}{P_1}$$

$$= \frac{20,00,000 - (10,00,000 - 1,00,000 \times 6)}{104}$$

$$= \frac{20,00,000 - 4,00,000}{104} = \frac{16,00,000}{104}$$

$= 15,385$ shares.

Problem 18.2. Omega company has a cost of equity capital of 10%, the current value of the firm *(v)* is Rs. 20,00,000 (@ Rs. 20 per share).

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Assume values for I (new investment); Y (earnings) and D (dividends) at the end of the year I = Rs. 6,80,000, Y = Rs. 1,50,000 and D = Re. 1 per share. Show that under the MM assumptions, the payment of D does not affect the value of the firm.

(M. Com., Delhi)

Solution :

(a) **VALUE OF THE FIRM WHEN DIVIDENDS ARE PAID :**

(i) Price of the share at the end of the current financial year

$$P_1 = P_0 (1 + k_e) - D_1$$
$$= 20 (1 + .10) - 1$$
$$= \text{Rs. } 21$$

(ii) Number of shares to be issued

$$m = \frac{I - (E - nD_1)}{P_1}$$
$$= \frac{6,80,000 - (1,50,000 - 1,00,000 \times 1)}{21}$$
$$= \frac{6,30,000}{21} = 30,000 \text{ shares}$$

(iii) Value of the firm

$$nP_0 = \frac{(n + m) P_1 - (I - E)}{1 + k_e}$$
$$= \frac{(1,00,000 + 30,000) \times 21 - (6,80,000 - 1,50,000)}{1 + .10}$$
$$= \frac{27,30,000 - 5,30,000}{1.10}$$
$$= \frac{22,00,000}{1.10}$$
$$= \text{Rs. } 20,00,000$$

(B) VALUE OF THE FIRM WHEN DIVIDENDS ARE NOT PAID

(i) Price per share at the end of the year

$$P_1 = P_0 (1 + k_e) - D_1$$
$$= 20 (1 + .10) - 0$$
$$= 20 (1.10) - 0$$
$$= 22$$

(ii) Number of shares to be issued

$$m = \frac{I - (E - nD_1)}{P_1}$$
$$= \frac{6,80,000 - (1,50,000 - 1,00,000 \times 0)}{22}$$
$$= \frac{6,80,000 - 1,50,000}{22}$$
$$= \frac{5,30,000}{22}$$

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(iii) Value of the firm

$$nP_0 = \frac{(n + m) P_1 - (I - E)}{1 + k_e}$$

$$= \frac{\left(\frac{1,00,000 + 5,30,000}{22}\right) \times 22 - (6,80,000 - 1,50,000)}{1 + .10}$$

$$= \frac{\frac{1,00,000 + 5,30,000}{22} \times \frac{22}{1} - 5,30,000}{1.10}$$

$$= \frac{27,30,000 - 5,30,000}{1.1}$$

$$= \frac{22,00,000}{1.10}$$

$$= \text{Rs. } 20,00,000$$

Hence, whether dividends are paid or not, the value of the firm ramains the same Rs. 20,00,000.

Problem 18.3. The Apex Company which earns Rs. 5 per share is capitalised at 10% and has a return of 12%. Using Walter Model determine :

(i) the optimum pay-out ; and

(ii) the price of share at this pay out. *(M. Com., Delhi)*

Solution :

(i) Rate of return, r = 12%
Capitalisation Rate, Ke = 10%
As r > k, the company should retain the profits and pay-out should be 0%.

(ii) Price per share when dividend pay-out is 0%.

$$P = \frac{D}{K_e} + \frac{r(E - D)/k_e}{k_e}$$

$$= \frac{0}{.10} + \frac{.12\,(5 - 0)\,.10}{k_e}$$

$$= 0 + \frac{\frac{.12}{.10}(5)}{.10}$$

$$= \text{Rs. } 60.$$

Problem 18.4. The Agro-Chemicals Company belongs to a risk class for which the appropriate capitalisation rate is 10%. It currently has 1,00,000 shares selling at Rs. 100 each. The firm is contemplating the declaration of Rs. 5 as dividend at the end of the current financial year, which has just begun, What will be the price of the share at the end of the year, if a dividend in nost declared ? What will be if one is declared ? Answer this on the basis of MM model and assume no taxes.

Solution :

(ii) Price of the share at the end of the year if dividend is not declared :

$$P_1 = P_0 (1 + k_e) - D$$
$$= 100 (1 + .10) - 0$$
$$= \text{Rs. } 110.$$

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(ii) Price of the share when dividends are paid.

$$P_1 = P_0(1 + k_e) - D_1$$
$$= 100(1 + .10) - 5$$
$$= 110 - 5$$
$$= \text{Rs. } 105.$$

Problem 18.5. The details regarding three companies are given below :

X Ltd.	*Y Ltd.*	*Z Ltd.*
r = 12%	6%	8%
ke = 8%	8%	8%
E = Rs. 10	Rs. 10	Rs. 10

Compute the value of an equity share of each of these companies applying Walter's equation when dividend pay-out ratio is *(a)* 0%; *(b)* 20% ; *(c)* 60% ; and *(d)* 100%.

Solution :

As per Walter's equation :

$$\text{Value of share, } P = \frac{D}{k_e} + \frac{r(E - D)//Ke}{k_e}$$

Applying the above formula, the value of an equity share can be computed as under :

X Ltd.	*Y Ltd.*	*Z Ltd.*
(a) When dividend pay-out is 0% $P = \frac{0}{.08} + \frac{.12(10-0)/.08}{.08}$ = 0 + 187.5 = Rs. 187.5	$\frac{0}{.08} + \frac{.06(10-0)/.08}{.08}$ = 0 + 93.75 = 0 + 93.75	$\frac{0}{.08} + \frac{(10-0)/.08}{.08}$ = 0 + 125 = Rs. 125
(b) When dividend pay-out is 20 $P = \frac{2}{.08} + \frac{.12(10-2)/.08}{.08}$ = 25 + 150 = Rs. 175	$\frac{2}{.08} + \frac{.06(10-2)/.08}{.08}$ = 25 + 75 = Rs. 100	$\frac{2}{.08} + \frac{(10-2)/.08}{.08}$ = 25 + 100 = Rs. 125
(c) When dividend pay-out is 60% $P = \frac{6}{.08} + \frac{.12(10-6)/.08}{.08}$ = 75 + 75 = Rs. 150	$\frac{6}{.08} + \frac{.06(10-6)/.08}{.08}$ = 75 + 37.5 = Rs. 112.5	$\frac{6}{.08} + \frac{.08(10-6)/.06}{.08}$ = 75 + 50 = Rs. 125
(d) When dividend pay out is 100% $\frac{10}{.08} + \frac{.12(10-10)/.08}{.08}$ = 125 + 0 = Rs. 125	$\frac{10}{.08} + \frac{.06(10-10)/.08}{.08}$ = 125 + 0 = Rs. 125	$\frac{10}{.08} + \frac{.08(10-10)/.08}{.08}$ = 125 + 0 = Rs. 125

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Problem 18.6. The earnings per share of a company are Rs. 16. The market rate of discount applicable to the company 12.5%. Retained earnings can be employed to yield a return of 10%. The company is considering a payout of 25%, 50% and 75%. Which of these would maximise the wealth of shareholders ?

Solution :

As the rate of return on retained earnings (r = 10%) is less than the required rate of return (k_e = 12.5%), the shareholders would stand to gain if the firm distributes its earnings. For such a firm, the optimum pay out would be 100% at which the market price of the share would be maximum at Rs. 128 per share. However, out of the three options given in the problem the wealth of the shareholders would be maximised at 75% payout. The same can be proved with the help of Walter's Formula for determining the value of a share, as below :

$$P = \frac{D}{K_e} + \frac{r\,(E - D)/K_e}{K_e}$$

where, P = Market Price Per Share
D = Dividend Per Share
r = Internal Rate of Return
E = Earnings Per Share
and, k_e = Cost of Equity Capital or Capitalisation Rate

(a) When Payout Ratio is 25% or Dividend is Rs. 4 per share

$$P = \frac{4}{.125} + \frac{.10\,(16 - 4)/.125}{.125}$$

$$= \frac{4}{.125} + \frac{\frac{.10}{.125}(12)}{.125}$$

$$= \frac{4}{.125} + \frac{9.6}{.125} = \frac{13.6}{.125}$$

= Rs. 108.80.

(b) When Payout Ratio is 50% or Dividend is Rs. 8 per share

$$P = \frac{8}{.125} + \frac{.10\,(16-8)/.125}{.125}$$

$$= \frac{8}{.125} + \frac{\frac{.10}{.125}(8)}{.125}$$

$$= \frac{8}{.125} + \frac{6.4}{.125} = \frac{14.4}{.125}$$

= Rs. 115.20

(c) When Payout Ratio is 75% or Dividend is Rs. 12 per share

$$P = \frac{12}{.125} + \frac{.10\,(16 - 12)/.125}{.125}$$

$$\frac{12}{.125} \quad \frac{\frac{.10}{.125}(4)}{.125}$$

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$$= \frac{12}{.125} + \frac{3.2}{.125} = \frac{15.2}{.125}$$

= Rs. 121.60.

Thus, market price per share is maximum at 75% payout which will maximise the wealth of shareholders.

Problem 18.7. The earnings per share of a company are Rs. 10 and the rate of capitalisation applicable to it is 10%. The company has before it the options of adopting a payout of 20% or 40% or 80% Using Walter's formula, compute the market value of the company's share if the productivity of retained earnings is *(i)* 20%, *(ii)* 10%, *(iii)* 8%.

What inference can be drawn from the above exercise.

Solution :

According to Walter's Formula,

$$P = \frac{D}{k_e} + \frac{r\,(E - D)/k_e}{k_e}$$

where, P = Market Price per share
D = Dividend per share
r = Internal rate of return or productivity of retained earnings.
E = Earnings per share, and
K_e = Cost of equity capital or capitalisation rate.

COMPUTATION OF MARKET VALUE OF COMPANY'S SHARES

(i) r = 20% *(ii)* r = 10% *(iii)* r = 8%

(a) When dividend payout ratio is 20%

$$P = \frac{2}{.10} + \frac{.20\,(10 - 2)/.10}{.10}$$

$$= \frac{2}{.10} + \frac{\frac{.20}{.10}(8)}{.10}$$

$$= \frac{2}{.10} + \frac{16}{.10}$$

$$= \frac{18}{.10}$$

= Rs. 180.

$$P = \frac{2}{.10} + \frac{.10\,(10 - 2)/.10}{.10}$$

$$= \frac{2}{.10} + \frac{\frac{.10}{.10}(8)}{.10}$$

$$= \frac{2}{.10} + \frac{8}{.10}$$

$$= \frac{10}{.10}$$

= Rs. 100.

$$P = \frac{2}{.10} + \frac{.08\,(10 - 2)/.10}{.10}$$

$$= \frac{2}{.10} + \frac{\frac{.08}{.10}(8)}{.10}$$

$$= \frac{2}{.10} + \frac{6.4}{.10}$$

$$= \frac{8.4}{.10}$$

= Rs. 84.

(b) When dividend payout ratio is 40%.

$$P = \frac{4}{.10} + \frac{.20\,(10 - 4)/.10}{.10}$$

$$= \frac{4}{.10} + \frac{\frac{.20}{.10}(6)}{.10}$$

$$= \frac{4}{.10} + \frac{12}{.10}$$

$$= \frac{16}{.10}$$

= Rs. 160.

$$P = \frac{4}{.10} + \frac{.10\,(10 - 4)/.10}{.10}$$

$$= \frac{4}{.10} + \frac{\frac{.10}{.10}(6)}{.10}$$

$$= \frac{4}{.10} + \frac{6}{.10}$$

$$= \frac{10}{.10}$$

= Rs. 100.

$$P = \frac{4}{.10} + \frac{.08\,(10 - 4)/.10}{.10}$$

$$= \frac{4}{.10} + \frac{\frac{.08}{.10}(6)}{.10}$$

$$= \frac{4}{10} + \frac{4.8}{10}$$

$$= \frac{8.8}{.10}$$

= Rs. 88

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(c) When dividend payout ratio is 80%.

$$P = \frac{8}{.10} + \frac{.20\ (10 - 8)/.10}{.10}$$

$$= \frac{8}{.10} + \frac{\frac{.20}{.10}(2)}{.10}$$

$$= \frac{8}{10} + \frac{4}{10}$$

$$= \frac{12}{.10}$$

= Rs. 120.

$$P = \frac{8}{.10} + \frac{.10\ (10 - 8)/.10}{.10}$$

$$= \frac{8}{.10} + \frac{\frac{10}{.10}(2)}{.10}$$

$$= \frac{8}{.10} + \frac{2}{.10}$$

$$= \frac{10}{.10}$$

= Rs. 100

$$P = \frac{8}{.10} + \frac{.8\ (10 - 8)/.10}{.10}$$

$$= \frac{8}{.10} + \frac{\frac{.08}{.10}(2)}{.10}$$

$$= \frac{8}{10} + \frac{1.6}{10}$$

$$= \frac{9.6}{.10}$$

= Rs. 96.

Problem 18.8. Two companies – Alpha Ltd. and Beta Ltd. are in the same industry with identical earnings per share for the last five years. The Alpha Ltd. has a policy of paying 40% of earnings as dividends, while the Beta Ltd. pays a constant amount of dividend per share. There is a disparity between the market prices of the shares of the two companies. The price of the Alpha's share is generally lower than that of the Beta, even though in some years Alpha paid more dividends than Beta. The data on earnings, dividends and market price for the two companies are as under :

Alpha Ltd.

Year	*EPS* Rs.	*DPS* Rs.	*Market Price* Rs.
1992	4.00	1.60	12.00
1993	1.50	0.60	8.50
1994	5.00	2.00	13.50
1995	4.00	1.60	11.50
1996	8.00	3.20	14.50

Beta Ltd.

Year	*EPS* Rs.	*DPS* Rs.	*Market Price* Rs.
1992	4.00	1.80	13.50
1993	1.50	1.80	12.50
1994	5.00	1.80	12.50
1995	4.00	1.80	12.50
1996	8.00	1.80	15.00

Required :

(a) Calculate *(i)* payout ratio *(ii)* dividend yield ; *(iii)* earnings yield for both the companies.

(b) What are the reasons for the difference in market prices of these two companies' shares ?

(c) What can be done by Alpha Ltd. to increase the market price of its shares.

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Solution :

(a)

Year	Payout-Ratio		Dividend Yield		Earnings Yield	
	Alpha Ltd.	Beta Ltd.	Alpha Ltd.	Beta Ltd.	Alpha Ltd.	Beta Ltd.
	Payout Ratio = DPS / EPS		Earnings yield = DPS / MPS		Earnings Yield = EPS / MPS	
1992	0.40	0.45	0.13	0.13	0.33	0.30
1993	0.40	1.20	0.07	0.14	0.18	0.12
1994	0.40	0.36	0.15	0.14	0.37	0.40
1995	0.40	0.45	0.14	0.14	0.35	0.32
1996	0.40	0.23	0.22	0.12	0.55	0.53

(b) Alpha Ltd. has followed the policy of paying constant dividend payout ratio and Beta Ltd. has followed constant dividend per share. Thus, the dividend per share in case of Alpha Ltd. has been fluctuating. The market has discounted this fluctuating DPS of Alpha Ltd; and hence the market price of share of Alpha Ltd. has been lower than that of Beta Ltd.

(c) As the market evaluates the shares of the two companies in terms of dividend payout, Alpha Ltd. should change its dividend policy from constant payout ratio to constant dividend per share with growth to increase the market price of its shares.

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19

Bonus Issue and Rights Issue

Problem 19.1. The following figures have been extracted from the books of XYZ Company Ltd., as on 31-12-1991:

Existing paid-up capital	Rs. 60,00,000
Free Reserves	Rs. 80,00,000
Average Profits during the previous three years	Rs. 30,00,000

The company proposes to capitalise its reserves in order to declare fully paid bonus shares. Determine the maximum amount available for capitalisation.

Solution :

Maximum amount to be Capitalised can be determined as follows :

1. *Residual Test*

$$\frac{5FR-2C}{7}$$

FR = Free reserve

C = Capital

$$\frac{(5\times80)-(2\times60)}{7}$$

$$\frac{400-120}{7} = \text{Rs. } 40 \text{ lakhs.}$$

Residual reserves after capitalisation should be at least 40 percent of the increased paid up capital.

2. *Rate of Dividend or Profitability Test:*

$$3AP-C$$

AP = Average Profits for the previous three years

C = Existing Capital

$3\times30-60$

= Rs. 30 lakhs.

3. *Over all Limit Test:*

Total maximum amount to be capitalised = Total paid up capital of the Company.

In this case capital of the company is Rs. 60 lakhs.

The least of the three above mentioned limits *i.e.* Rs. 30 lakhs will be the amount to be capitalised.

Note : As per the modified guidelines issued on 13.4.1994, SEBI has relaxed the Residual Reserve requirement and the Profitability Requirement. The Board of Directors of the companies wishing to make bonus issues are required to take into consideration the relevent financial factors and observe the modified guidelines. Henceforth, issue of bonus shares after any public/rights issue is subject to the condition that no bonus issue shall be made which will dilute the value or rights of the holders of debentures convertible fully or partly.

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Problem 19.2. The following are the extracts from the draft Balance Sheet of ABC Company Ltd., as on 31-3-1996.

	Rs.
Authorised Capital :	
15,000 Equity shares of Rs. 20 each	3,00,000
Issued & subscribed Capital :	
8,000 Equity shares of Rs. 20 each	1,60,000
Reserve Fund	90,000
Profit and Loss Account	60,000

A resolution was passed by the company determining bonus of 2 equity shares for every 5 shares held at present. For this purpose Rs. 35,000 are to be provided out of Reserve Fund and the balance out of Profit and Loss Account.

Make necessary journal entries to give effect to the resolution and show how they would affect the balance sheet.

Solution :

$$\text{No. of shares to be issued as bonus} = \frac{8,000}{5} \times 2 = 3,200 \text{ shares}$$

Amount for issue of bonus = $3,200 \times 20 = 64,000$

		Rs.	*Rs.*
Reserve Fund A/c	...*Dr.*	35,000	
Profit and Loss A/c	...*Dr.*	29,000	
To Bonus to Shareholders			64,000
(Being amoung provided for issue of bonus shares)			
Bonus to Shareholders A/c	...*Dr.*	64,000	
To Equity Share Capital A/c			64,000
(Being issue of 3,200 share @ Rs. 20 as bonus shares)			

BALANCE SHEET

(Liabilities Side)

	Rs.
Authorised capital:	
15,000 Equity shares Rs.20 each	3,00,000
Issue and subscribed capital:	
11,200 Equity shares of Rs. 20 each	2,24,000
(Out of these shares 3,200 shares have been issued as bonus shares	
Reserve fund	55,000
Profit and Loss Account	31,000

Problem 19.3. X Company Ltd. has a share capital of Rs. 5,00,000 The company has a reserve fund of Rs. 8,00,000 and declares a bonus of Rs. 3,60,000. The bonus is to be paid by issue of fully paid equity shares of Rs. 10 each at a premium of Rs. 2 per share. Shares are quoted at Rs. 18 each on the date of allotment of bonus shares. Make Journal entries to record the above.

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Solution :

JOURNAL

		Rs.	*Rs.*
Reserve Fund A/c	*Dr...*	3,60,000	
To Bonus to Share holders			3,60,000
(Being bonus issued to shareholders out of reserve fund)			
Bonus to Shareholders A/c	*Dr...*	3,60,000	
To Share Capital A/c			3,00,000
To Share Premium A/c			60,000
(Being 30,000 shares of Rs. 10 each issued at a premim of Rs. 2 per share out of bonus issue)			

Problem 19.4. A company has a share capital of Rs. 10 lakhs and it has accumulated free reserves amounting to Rs. 18 lakhs. Average Profits for the previous three years before tax are Rs. 6 lakhs. Calculate the maximum amount of free reserves that can be capitalised by the company to issue fully paid bonus shares.

Solution :

The maximum amount that can be used for issue of bonus shares is the least of the following three:

1. Residual Test :

The residual reserves after capitalisation should be at least 40 per cent of the increased paid up capital.

2. Rate of Dividend or Profitability Test :

30% of the average profits before tax for previous three years should yield a maximum 10% rate of divided on the expanded capital base of the company.

3. Overall Limit :

The total amount to be capitalised, at any time, cannot exceed the total amount of the paid -up eqauity capital of the company.

1. According to Residual Test :

$$\frac{5FR - 2C}{7}$$ (Where FR represents free reserves and C represents capital)

$$\frac{(5\times18) - (2\times10)}{7} = \frac{70}{7} = \text{Rs. } 10 \text{ lakhs.}$$

2. Rate of Dividend or Profitability Test :

3 AP-C (Where AP is average profits for the previous three years and C represents existing

(3×6)-10 capital of the company)

= Rs. 8 lakhs.

3. Overall Limit Test :

Total amount to be capitalised = Rs.10 lakhs (total paid-up capital of the company)

The least of the three is Rs. 8 lakhs so Rs. 8 lakhs can be capitalised

Note : According to the modified guidelines issud by SEBI on 13.4.1994, there are no such restrictions on the maximum quantum of bonus issue.

Problem19.5. A company offers to its shareholders the right to purchase 3 equity shares of Rs. 100 each at a premium of 20% for every 5 shares of Rs. 100 each held at present in the company. The market value of the shares is Rs. 350. Calculate the value of the right.

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Solution :

Value of right is calculated as :

$$V = \frac{M-S}{N+1}$$

V = Value of right

M = Market price of shares

S = Price offered for right shares

N = Number of shares to get one right share

$$V = \frac{350-120}{\frac{5}{3}+1}$$ (five shares are required to get three shares)

$$V = \frac{\frac{230}{5}}{\frac{3}{3}+1} = \frac{\frac{230}{8}}{\frac{3}{3}}$$

$$V = \frac{230\times3}{8} = \text{Rs. } 86.25$$

Value of right is Rs. 86.25

Problem19.6. Ratan Manufacturing Co. has a share capital of 40,000 Equity shares of Rs. 10 each, Rs. 8 paid up. The company has a Reserve Fund of Rs. 1,00,000. It was decided to issue bonus shares and partly paid shares were made fully paid.

Pass necessary Journal entries.

Solution :

JOURNAL ENTRIES

		Rs.	*Rs.*
Reserve Fund A/c	...*Dr.*	80,000	
To Bonus to Shareholders			80,000
(Being the amount of reserve Fund to be used for issue of bonus shares)			
Bonus to Shareholders A/c	...*Dr.*	80,000	
To Equity Share Capital 80,000			
(Being the amount used to make party paid 40,000 equity shares fully paid).			80,000

Problem 19.7. The following is the summarised Balance Sheet of Pragati Ltd, as on Dec. 31,1995:

BALANCE SHEET

Liabilities	*Rs.*	*Assets*	*Rs.*
Share Capital		Fixed Assets	16,00,000
3,00,000 shares of Rs. 10 each fully paid	30,00,000	Investments	5,00,000
Share Premium	1,00,000	Current assets	24,50,000
General Reserve	8,00,000		
Debentures	1,50,000		
Current Liabilities	5,00,000		
	45,50,000		45,50,000

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The Board of Directors decided to issue one fully paid bonus share for every 5 shares held and a necessary approval was received from the Government. The share premium is to be used fully and the balance will be taken up from General Reserve.

Pass necessary Journal entries and prepare a Revised Balance Sheet.

Solution :

JOURNAL ENTRIES

		Rs.	*Rs.*
Share Premium A/c	...*Dr.*	1,00,000	
General Reserve A/c	...*Dr.*	5,00,000	
To Bonus to Shareholders A/c			6,00,000
(Bonus issue of 60,000 shares of Rs. 10 each is taken up)			
Bonus to Shareholder A/c	...*Dr.*	6,00,000	
To Share Capital A/c			6,00,000
(Issue of 60,000 shares of Rs. 10 each as bonus shares)			

BALANCE SHEET

As on Dec., 31,1995

Liabilities	*Rs.*	*Assets*	*Rs.*
Share Capital		Fixed Assets	16,00,000
3,60,000 shares of Rs. 10 each		Investments	5,00,000
each fully paid	36,00,000	Current Assets	24,50,000
(60,000 shares are issued as bonus shares out of share premium and general reserve)			
General Reserve	3,00,000		
Debentures	1,50,000		
Current Liabilities	5,00,000		
	45,50,000		45,50,000

Problem 19.8. The following is the Balance Sheet of Nadia Coal Ltd., as on Dec. 31,1994

BALANCE SHEET

As on Dec. 31,1994

Liabilities	*Rs.*	*Assets*	*Rs.*
Issued and Subscribed capital:		Sundry Assets	38,00,000
20,000 shares of Rs. 100 each fully paid	20,00,000		
General Reserve	15,00,000		
Current Liabilities	3,00,000		
	38,00,000		38,00,000

The company got permission from Controller of Capital for raising share capital by 10,000 shares of Rs. 100 each at par, the Board of Directors decided to use general reserve for issuing additional capital at the rate of one share for every two shares held.

Prepare ledger accounts incorporating above mentioned changes and give a Revised Balance Sheet as on Dec. 31, 1994.

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Solution :

LEDGER

GENERAL RESERVE

	Rs.		Rs.
To Bonus to shareholders	10,00,000	By Balance b/d	15,00,000
To Balance c/d	5,00,000		
	15,00,000		15,00,000

BONUS TO SHARE HOLDERS ACCOUNT

	Rs.		Rs.
To Share Capital	10,00,000	By General Reserve	10,00,000
	10,00,000		10,00,000

SHARE CAPITAL ACCOUNT

	Rs.		Rs.
To Share Capital	30,00,000	By Balance b/d	20,00,000
		By Bonus to Shareholders	10,00,000
	30,00,000		30,00,000

NADIA COAL LTD.

BALANCE SHEET

As on 31st Dec., 1984

	Rs.		Rs.
Issued and Subscribed Capital:		Sundry Assets	38,000,00
30,000 shares of Rs. 100 each full paid	30,00,000		
(Out of the above 10,000 shares of Rs. 100 each were issued as bonus shares out of general reserve			
General Reserve	5,00,000		
Current Liabilities	3,00,000		
	38,00,000		38,00,000

Problem 19.9. Grover Ltd., Simla, had a paid up share capital of Rs.50,00,000 in 50,000 equity shares of Rs. 100 each. The Reserve Fund Account and Share Premium Account had a balance of Rs. 10,00,000 and Rs. 4,00,000 respectively. It was decided to issue one bonus share at par for every four shares held. Pass necessary journal entries to record the issue of bonus shares.

Solution:

$$\text{No. of Bonus Shares } \frac{50,000}{4} \times 1 = 12,500$$

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JOURNAL ENTRIES

		Rs.	Rs.
Share Premim Account	...Dr.	4,00,000	
Reserve Fund Account	...Dr.	8,50,000	
To Bonus to Shareholders Account			12,50,000
(Being amount provided for the issue of one bonus share for every four shares held)			
Bonus to Shareholders	...Dr.	12,50,000	
To Share Capital Account			12,50,000
(Issue of 12,500 shares of Rs. 100 each fully paid as bonus shares)			

Problem 19.10. The following are the extracts from the Balance Sheet of Rohini Ltd. as at 31st December, 1994 :

Authorised Capital :

1,00,000 Equity Shares of Rs. 5 each 5,00, 000

Issued and Subscribed Capital :

50,000 Equity Shares of Rs. 5 each fully called up and paid up 2,50,000
Reserve Fund 1,00,000
Profit and Loss Account 25,000

A resolution was passed declaring a bonus of 20% on equity shares to be provided as to Rs. 40,000 out of Reserve Fund and the balance out of Profit and Loss account. The bonus was to be satisfied by issuing one fully paid equity share for every five shares held.

Pass journal entries in the books of the company and show how these entries will affect balance sheet.

Solution :

JOURNAL

		Rs.	Rs.
Reserve Fund Account	...Dr.	40,000	
Profit & Loss Account	...Dr.	10,000	
To Bonus to Shareholders			50,000
Issue of 20% bonus shares out of reserve fund			
Bonus to Shareholders Account	...Dr.	50,000	
To Share Capital Account			50,000
(Issue of 10,000 shares at Rs. 10 each fully paid as bonuss shares)			

ROHINI LTD.

Extract From Balance Sheet
(as on 31st Dec.,1994)

	Rs.
Liabilities Side	
Authorised Capital	
1,00,000 Equity Shares of Rs. 5 each	5,00,000
Issued and Subscribed Capital	3,00,000
60,000 Equity Shares of Rs.5 each fully paid	
(Out of this 10,000 shares are issued as bonus)	60,000
Reserve fund	15,000
Profit and Loss Account	

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Problem 19.11. A company Offers to its shareholders the right to buy one share of Rs. 12 each for every four shares of Rs. 10 each held. The market value of share is Rs. 30 each.

Calculate the value of the right.

Solution :

Value of right can be calculated with the help of the following formula :

$$V = \frac{M-S}{N+1}$$

V = Value of right

M = Marker price of shares
S = Price offered for right shares
N = Number of shares to get one right share

$$V = \frac{30-12}{4+1}$$

$$= \frac{18}{5} \text{ Rs. } 3.60$$

Alternatively, value of right can be calculated as follows:

	Rs.
Market value of 4 shares already held by a shareholder	120
Add: the price to be paid for acquiring one additional share	12
Total price for five shares	132

$$\text{Average price of one share} = \frac{132}{5} = \text{Rs. } 26.40$$

Value of right = Market Price — Average Price
= 30 – 26.40
= Rs. 3.60

Problem 19.12. XYZ Ltd. has issued 20,000 shares of Rs. 10 each. The current market price pr share is Rs. 40. The company has a plan to make a rights issue of one equity share at a price of Rs. 30 for every four shares held. You are required to :

(a) Calculate the theoretical post-rights price per share.
(b) Calculate the value of the rights alone.
(c) Show the effect of the rights issue on the wealth of a shareholder who has 2000 shares assuming he sells the entire rights.
(d) Show the effect if the same shareholder does not take any action and ignores the issue.

Solution :

(i) Theoratical post-rights; issue price :

$$P = \frac{MN_1 + SN_2}{N_1+N_2}$$

$$= \frac{40\times4+30\times1}{4+1}$$

$$= \frac{190}{5}$$

$$= \text{Rs. } 38$$

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(ii) Theoratical Value of the right :

$$V = \frac{M - S}{N + 1}$$

$$= \frac{40 - 30}{4 + 1}$$

$$= \frac{10}{5}$$

= Rs. 2 per share (on existing number of shares)

Alternatively, we can say that the value of right is Rs. 38-30=Rs. 8 per share (on shares offered.

(iii) Effect of Rights Issue on the wealth of a shareholder having 2000 shares assuming he sells the entire rights :

		Rs.
Value of 2000 shares before the right issue	= Rs. 2000×40	= Rs. 80,000
Value of 2000 share after the right issue	= Rs. 2000×38	= Rs. 7,6000
Add : Realisation from sale of rights	= Rs. 500 × 8	= Rs. 4,000
Total value		80,000

Thus, there is no effect on the wealth of the shareholder :.

(iv) Effect of Rights Issue when no action is taken and rights are ignored :

Value of 2000 shares before the right issue	= Rs. 80,000
Value of 2000 shares after the right issue	= Rs. 76,000
Loss or Diminuation in the value	= Rs. 4,000

Problem 19.13. The PQR Ltd. has 9,00,000 shares outstanding at current market price of Rs. 130 per share. The company needs Rs. 2.25 crore to finance its proposed modernisation-cum expansion project. The board of the company has dcided to issue rights for raising the required money. The subscription (issue) price (Ps) has been fixed at Rs. 75 per share. The subscription price has been set below the market price to ensure that rights issue is fully subscribed. *(a)* How many rights required to purchase a new share ? *(b)* What is the price of one share after rights offering ? *(c)* What is the value of a right when the share is selling cum-rights.

Solution :

Number of new shares to be issued to raise Rs. 2.25 crore at Rs. 75 per share:

$$= \frac{\text{Desired Amount of Funds}}{\text{Subscription Price (Ps)}}$$

$$= \frac{2,25,00,000}{75}$$

= 3,00,000 shares.

(a) Rights required to purchase a new share

$$= \frac{\text{Existing Number of Shares}}{\text{Number of New shares}}$$

$$= \frac{9,00,000}{3,00,000}$$

= 3 rights

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(b) Price of one share after rights offering

$$\text{Theoratical Price} = \frac{\text{(Number of Existing shares} \times \text{Current Market Price} + \text{(New shares} \times \text{Subscription Price)}}{\text{Number of Existing shares + New Shares}}$$

$$= \frac{(9,00,000 \times 130) + (3,00,000 \times 75)}{9,00,000 + 3,00,000}$$

$$= \text{Rs. } 116.25$$

(c) Value of right when the share is selling cum-rights

$$\text{Value of 3 Rights} = \text{Rs. } 116.25 - 75.00$$

$$= \text{Rs. } 41.25$$

$$\text{Value of 1 (each) Right} = \frac{41.25}{3} = \text{Rs.. } 13.75$$

Thus, the price of the share drops by Rs. 13.75 on ex-right date from cum-right price of Rs. 130 to the ex-right price of Rs. 130 –13.75= Rs. 116.25.

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20

Depreciation Policy

Problem 20.1. A company purchased a machinery worth Rs. 95,000 on 1st January 1995 and spent Rs. 5,000 on its erection. It buys additional machinery on 30th June 1996 for a sum of Rs. 20,000. Assuming that rate of depreciation is 10% show Machinery Account for 5 years under *(i)* Straight Line Method and *(ii)* Diminishing Balance Method.

Solution :

(i) Straight Line Method

MACHINERY ACCOUNT

Date	*Particulars*	*Amount Rs.*	*Date*	*Particulars*	*Amount Rs.*
1995					
Jan. 1	To Bank	95,000	Dec. 31	By Depreciation	10,000
	To Bank-erection charges	5,000	,,	By Balance c/d.	90,000
		1,00,000			1,00,000
1996			1996		
Jan. 1	To Balance b/d	90,000	Dec. 31	By Depriciation For full year on Rs. 1,00,000 for 6 months on Rs. 20,000	11,000
Junr 30	To Bank	20,000		By Balanc c/d	99,000
		1,10,000			1,10,000
1997			1997		
Jan. 1	To Balance b/d	99,000	Dec. 31	By Depreciation	12,000
			,,	By Balance c/d	87,000
		99,000			99,000
1998			1998		
Jan. 1	To Balance b/d	87,000	Dec. 31	By Depreciation	12,000
				By Balance c/d	75,000
		87,000			87,000
1999			1999		
			Dec. 31	By Depreciation	12,000
Jan. 1	To Balance b/d	75,000	,,	By Balance c/d	63,000
		75,000			75,000

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(ii) Diminishing Balance Method

MACHINERY ACCOUNT

Date 1995	*Particulars*	*Amount Rs.*	*Date 1995*	*Particulars*	*Amount Rs.*
Jan. 1	To Bank	95,000	Dec. 31	By Depreciation	10,000
	To Bank-erection charges	5,000	"	By Balance c/d.	90,000
		1,00,000			1,00,000
1996					
Jan. 1	To Balance b/d	90,000	1996		
June 30	To Bank	20,000	Dec. 31	By Depreciation for one year on Rs. 90,000 for six months on Rs. 20,000	10,000
				By Balance c/d	1,00,000
		1,00,000			1,10,000
1997			1997		
Jan. 1	To Balance b/d	1,00,000	Dec. 31	By Depreciation	10,000
			"	By Balance c/d.	90,000
		1,00,000			1,00,000
1998			1998		
Jan. 1	To Balance b/d.	90,000	Dec. 31	By Depreciation	9,000
			"	By Balance c/d	81,000
		90,000			90,000
1999			1999		
Jan. 1	To Balance b/d	81,000	Dec. 31	By Depreciation	8,100
				By Balance c/d.	72,900
		81,000			81,000

Problem 20.2. A firm purchases a Machinery on 1st January, 1995, for a sum of Rs. 1,50,000. On 30th June of the same year it purchases an additional machinery worth Rs. 20,000. On 31st December, 1997, the machinery purchased on 30th June, 1995 becomes obsolete and is disposed off for a sum of Rs. 6,000.

The firm provides depreciation @ 20% on reducing balance system. Prepare ledger accounts for first three years when *(i)* Depreciation is written off in asset account and *(ii)* Depreciation is taken to 'Depreciation Provisions Account'.

Solution :

(ii) When Depreciation is written off in Asset Account

MACHINERY ACCOUNT

Date 1995	*Particulars*	*Amount Rs.*	*Date 1995*	*Particulars*	*Amount Rs.*
Jan. 1	To Bank	1,50,000	Dec. 31	By Depreciation	32,000
June 30	To Bank	20,000	"	By Balance c/d	1,38,000
		1,70,000			1,70,00
Jan. 1	To Balance b/d	1,38,000	Dec. 31	By Depreciation	27,600
				By Balance c/d.	1,10,400
		1,38,000			1,38,000

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1997			1997		
Jan 1	To Balance b/d	1,10,400	Dec. 31	By Depreciation	22,080
			"	By Bank-sale	6,000
			"	By P & L A/c.-loss on sale	5,520
			"	By Balance c/d.	76,800
		1,10,400			1,10,400

(ii) When Depreciation is taken to Depreciation Provision Account

MACHINERY

Date	*Particulars*	*Amount Rs.*	*Date*	*Particulars*	*Amount Rs.*
1995			1995		
Jan. 1	To Bank	1,50,000	Dec. 31	By Balance c/d.	1,70,000
June 30	To Bank	20,000			
		1,70,000			1,70,000
1996			1996		
Jan. 1	To Balance b/d.	1,70,000	Dec. 31.	By Balance c/d.	1,70,000
		1,70,000			1,70,000
1997			1997		
jan. 1	To Balance b/d.	1,70,000	Dec. 31	By Bank-sale	6,000
			"	By Depreciation Provision A/c.	8,480
				By P & L A/c.	5,520
				By Balance c/d.	1,50,000
		1,70,000			1,70,000

DEPRICIATION PROVISION ACCOUNT

Date	*Particulars*	*Amount Rs.*	*Date*	*Particulars Rs.*	*Amount*
1995			1995		
Dec. 31	To Balance c/d.	32,000	Dec. 31	By P & L A/c.	32,000
		32,000			32,000
1996			1996		
			Jan. 1	By Balance b/d.	32,000
Dec. 31	To Balance c/d.	59,600	Dec. 31	By P & L A/c.	27,600
		59,600			59,600
1997			1997		
Dec. 31	To Machinery	8,480	Jan. 1	By Balance b/d.	59,600
	To Balance c/d.	73,200	Dec. 31	P & L A/c.	22,080
		81,860			81,680

Problem 20.3. A company acquires a lease for three years for a sum of Rs. 40,000 on 1st January 1991. It decides to write off depreciation on Anuity Method, presuming 5% as the rate of interest. As per Annunity Table an amount of .367208 at 5% rate of interest is required for an Annuity of Re. 1 in three years.

Prepare Lease Account for various years.

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Solution :

LEASE ACCOUNT

Date	*Particulars*	*Amount Rs.*	*Date*	*Particulars*	*Amount Rs.*
1991			1991		
Jan.1	To Bank	40,000.00	Dec.1	By Depreciation	14,688.32
			Dec. 31		
Dec. 31	To Interest	2,000.00		By Balance c/d	27,311.68
		42,000.00			42,000.00
1992			1992		
Jan.1	To Balance b/d	27,311.68	Dec.	By Depreciation	14,688.32
Dec. 31	To Interest	1,365.84		By Balance c/d	13,989.20
		28,677.52			28,677.52
1993			1993		
Jan.1	To Balance b/d	13,989.20			
Dec. 31	To Interest	699.12	Dec. 31	By Depreciation	14,688.32
		14,688.32			14,688.32

Problem 20.4. From the following data, find out the depreciation for the year 1996 according to :

(i) the sum of years, digits method and rate of depreciation of the machine-

January 1, 1995

Cost : Rs. 1,10,000
Scrap Value : Rs. 11,000
Estimated useful life : 10 years

Solution :

(i) Sum of years' Digits Method

Life of the machine (given) = 10 years

Hence the sum of the years' digits = $1+2+3+4+5+6+7+8+9+10 = 55$

Depreciation Cost = Value of the assets - Scrap value

= Rs. 1,10,000 – Rs. 11,000 = Rs. 99,000

Rate of Depreciation : 1995 = Depreciable Cost $\times \frac{10}{55}$

1996 = Depreciation Cost $\times \frac{9}{55}$

1996 = $99{,}000 \times \frac{9}{55}$ = Rs. 16,200

Problem 20.5. The Indian Minerals Ltd. leased on June 30th 1989 a manganese ore mine for a sum of Rs. 5,00,000. It is estimated that toal quantity of ore in the mine is 1,00,000 tonnes. The annual output is as follows :

Year	Tonnes
1989	5,000
1990	20,000
1991	16,000
1992	21,000

Using the depletion method of depreciation, show the mine account for the above 4 years.

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Solution :

Depreciable per ton will be = $\frac{\text{Rs. } 5,00,000}{1,00,000}$ Rs. 5

MINE ACCOUNT

Date	*Particulars*	*Amount*	*Date*	*Particulars*	*Amount*
1989			*1989*		
June 30	To Bank	5,00,000	Dec. 31	By Depreciation	25,000
			"	By Balance c/d.	4,75,000
		5,00,000			5,00,000
1989			1990		
Jan. 1	To Balance b/d	4,75,000	Dec. 31	By Depreciation	1,00,000
				By Balance c/d.	3,75,000
		4,75,000			4,75,000
1990			1990		
Jn. 1	To Balance b/d	3,75,000	Dec. 31	By Depreciation	80,000
			"	By Balance c/d.	2,95,000
		3,75,000			3,75,000
1991			1992		
Jan. 1	To Balance b/d	2,95,000	Dec. 31	By Depreciation	1,05,000
			"	By Balance c/d.	1,90,000
		2,95,000			2,95,000
1992					
Jan. 1	To Balance b/d	1,90,000			

Problem 20.6. A company purchased a lease for Rs. 40,000 on 1st January 1988. It is to renewed at the end of four years. Sinking fund Table shows that Re. 0.232012 must be invested each year to obtain Re. 1 at the end of 4 years, the rate of interest being 5%.

On Dec. 31, 1991 the investments were sold at a profit of Rs. 500. A new lease was purchased on the 1st Jan., 1992 at a cost of Rs. 50,000.

Prepare various Ledger Accounts in the books of the company.

Solution :

LEASE ACCOUNT

1988			1988		
Jan. 1.	To Bank	40,000	Dec. 31.	By Balance c/d.	40,000
		40,000			40,000
1989			1989		
Jan. 1	To Balance b/d	40,000	Dec. 31.	By Balance c/d.	40,000
		40,000			40,000
1990			1990		
Jan. 1	To Balance b/d	40,000	Dec. 31	By Balance c/d.	40,000
		40,000			40,000
1991			1991		
Jan. 1	To Balance b/d.	40,000	Dec. 1	By Depreciation Fund A/c.- transfer	40,000
		40,000			40,000

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DEPRECIATION FUND ACCOUNT

1988 Dc. 31	To Balance c/d.	9,280.48	1988 Dec. 31	By Depreciation Account	9,280.48
		9,280.48			9,280.48
			1989 Jan. 1	By Balance b/d.	9,280.58
			Dec. 31	By Interest on Depreciation Fund Investment account	4,64.02
1989 Dec. 31	To Balance c/d.	19,024.98	"	By Depreciation Account	9,280.48
		19,024.98			19,024.98
1990 Dec. 31.	To Balance c/d.	29,256.71	1990 Jan. 1	By Balance b/d.	19,024.98
			Dec. 31.	By Interest on Dep. Fund Investment A/c.	915.25
		29,256.71	"	By Depreciation Account	9,280.48
					29,256.71
			1991 Jan. 1	By Balance b/d	29,256.71
			Dec. 31	By Interest on Depreciation Fund Investment Account	1,462.81
			"	By Depreciation Account	9,280.48
1991	To Lease Account	40,000.000	"	By Depreciation Fund Investment	
	To Profit & Loss Account	500.000		Account Profit on sale	500.00
		40,500.00			40,500.00

DEPRECIATION FUND INVESTMENT ACCOUNT

1988 Dec. 31	To Bank	9,280.48	1988 Dec. 31	By Balance c/d.	9,280.48
		9,280.48			9,280.48
1989 Jan. 1	To Balance b/d.	9,280.48	1989 Dec. 31	By Balance c/d.	19,024.98
Dec. 31	To Bank	9,744.50			
		19,024.98			19,024.98
1990 Jan. 1	To Balance b/d.	19,024.98	1990 Dec. 31	By Balance c/d.	29,256.71
Dec. 31	To Bank	10,231.73			
		29,256.71			29,256.71
1991 Jan. 1	To Balance b/d.	29,256.76	1991 Dec. 31	By Bank (29,256.76+500)	29,756.76
Dec. 31	To Depreciation Fund A/c. Profit	500.00			
		29,756.76			29,756.76

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NEW LEASE ACCOUNT

1991 Jan. 1	To Bank	50,000

Problem 20.7. ABC Ltd. Purchases a machine for a sum of Rs. 21,900 with a scrap value of Rs. 900 at the end of five years.

Find out the depreciation and written down value for 5 years undr the following methods :

(a) Working Hours Method-Estimated life in working hours-30,000 hours.

(b) Production Method-Estimated units of production in whole life-35,000 units.

Additional Information :

Year	*Working hours*	*Units Produced*
1	6,000	6,500
2	6,500	6,800
3	5,500	7,200
4	5,800	7,400
5	6,200	7,100
	30,000	35,000

Solution :

(a) Working Hours Method

Depreciation Base = Asset value - Scrap value at the end
= Rs. 21,900 – Rs. 900
= Rs. 21,000

Year (1)	*Hourly Rate (21,000÷30,000)* (2)	*Working Hours* (3)	*Amount of Depreciation* (4) (2×3)	*Written Down Value* (5)
		Rs.	*Rs.*	
1	70 P.	6,000	4,200	17,700 (21,900–4,200)
2	70 P.	6,500	4,550	13,150
3	70 P.	5,500	3,850	9,300
4	70 P.	5,800	4,060	5,240
5	70 P.	6,200	4,340	900

(b) Production Method

$$\text{Rate per unit} = \frac{21.900 - 900}{35,000} = 60 \text{ P.}$$

Year	*Per Unit Rate Produced*	*Units Produced*	*Amount of Depreciation*	*Written Down Value*
1	60 P.	6,500	3,900	18,000
2	60 P.	6,800	4,080	13,920
3	60 P.	7,200	4,320	9,600
4	60 P.	7,400	4,440	5,160
5	60 P.	7,100	4,260	900

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21

Capital Budgeting

Problem 21.1. Calculate the pay-back periods of the following projects each requiring a cash outlay of Rs. 1,00,000. Suggest which projects are acceptable if the standard pay-back period is 5 years.

Year	*Project A*	*Project B*	*Project C*
	Rs.	*Rs.*	*Rs.*
1	30,000	30,000	10,000
2	30,000	40,000	20,000
3	30,000	20,000	30,000
4	30,000	10,000	40,000
5	30,000	5,000	—

Solution :

Total Cash Outlay (in each project) = Rs. 1,00,000

Project A :

As the Cash Inflow is same, Rs. 30,000 in each year,

$$\text{Pay – back period} = \frac{\text{Intial Outlay of the Project}}{\text{Annual Cash Inflow}}$$

$$= \frac{1,00,000}{30,000} = 3.3 \text{ years.}$$

Project B and Project C :

The pay-back period is 4 years as total cash inflows for the first four years equal the Cash Outlay.

Project B

Cash Inflows in first 4 years
= Rs. 30,000 + 40,000 + 20,000 + 10,000
= 1,00,000.

Project C

Cash Inflows in first 4 years
= Rs. 10,000 + 20,000 + 30,000 + 40,000
= 1,00,000

As all the project have pay-back period of less than 5 years and 5 years is the standard pay-back period, all the three projects are acceptable.

Problem 21.2. A project costs Rs. 25,000 and has scarp value of Rs. 5,000 after 5 years. The net profits before depreciation and taxes for the five years period are expected to be Rs. 5,000, Rs. 6,000, Rs. 7,000, Rs. 8,000 and Rs. 10,000. You are required to calculate the accounting rate of return assuming 50% rate of tax and depreciation on straight line method.

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Solution :

CALCULATION OF ACCOUNTING RATE OF RETURN

Period	*1*	*2*	*3*	*4*	*5*	*Average*
	Rs.	*Rs.*	*Rs.*	*Rs.*	*Rs.*	*Rs.*
Net Profit before depreciation and taxs	5,000	6,000	7,000	8,000	10,000	7,200
Less : Depreciation $\left(\frac{25,000 - 5,000}{5}\right)$	4,000	4,000	4,000	4,000	4,000	4,000
Net Profit before taxes	1,000	2,000	3,000	4,000	6,000	3,200
Less : Taxes @ 50%	500	1,000	1,500	2,000	3,000	1,600
Net Profit after taxes	500	1,000	1,500	2,000	3,000	1,600

$$\text{Average Net Investment} = \frac{25,000 - 5,000}{2} = \text{Rs. } 10,000$$

$$\text{Accounting Rate of Return} = \frac{1,600}{10,000} \times 100$$

(on Average Investment) = 16%

Problem 21.3. Following is the relevant data for two machines A and B.

Particulars	*Rs.* A	*Rs.* B
Capital Outlay	2,000	2,400
Net Cash Flow		
1st year	1,000	800
2nd year	1,000	800
3rd year	—	2,000

Find out which of the two is a better investment showing necessary workings.

Solution :

Pay-back period :

Machiner A :

Total Cash Outflow = Rs. 2,000

Total Cash Inflows =Rs. 1,000 + 1,000 = Rs. 2,000

The total cash outlay of Rs. 2,000 is recovered in 2years and hence the pay-back period is 2 years.

Machine B :

Total Cash Outlay = Rs. 2,400

Total Cash Inflows (for 2 years) = Rs. 800 + 800 = Rs. 1,600

Upto the second year the total cost is not recovered but the total Cash Inflows for 3 years are Rs. 1,600 + 2,000 = Rs. 3,600, *i.e.* Rs. 1,200 more than the cost. So the pay-back period is some where between 2 and 3 years. Assuming that cash inflows occur evently throughout the year, the pay-back period is $2 \text{ years} + \frac{800}{2,000} = 2.4$ years.

As the pay-back period of Machine A is less than that of Machine B, it is clear that machine A is better. But Machine A does not give any earnings after the pay-back

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period while Machine B gives more earnings of Rs. 1,200 after the pay-back period. Hence, according to post pay-back profitability Machine B is a better investment.

Problem 21.4. A company proposing to expand its production can go either for an automatic machine costing Rs. 2,24,000 with an estimatd life of $5\frac{1}{2}$ years or an ordinary machine costing Rs. 60,000 having an estimated lif of 8 years. The annual sales and costs are estimated as follows :

	Automatic Machine Rs.	*Ordinary Machine* Rs.
Sales	1,50,000	1,50,000
Costs :		
Material	50,000	50,000
Labour	12,000	60,000
Variable Overheads	24,000	20,000

Compute the comparative profitability under the pay-back method.

Solution :

		Automatic Machine Rs.		*Ordinary Machine* Rs.
Sales (per annum)		1,50,000		1,50,000
Less : Variable cost				
Material	50,000		50,000	
Labour	12,000		60,000	
Variable Overheads	24,000		20,000	
		86,000		1,30,000
Marginal Profits (Contribution)		64,000		20,000
	2,24,000			60,000
Pay-back period	64,000			20,000
	$3\frac{1}{2}$ years			3 years
Post pay-back profitability 64,000	($5\frac{1}{2} - 3\frac{1}{2}$ years) = Rs. 1,28,000			20,000(8 – 3 years) =Rs. 1,00,000.

Problem 21.5. A limited company is considring the purchase of a new machine which will carry out some operations performed by labour. X and Y are alternative models. From the following information, you are required to prepare a profitability statement and work out the pay back period for each model.

	Model X Rs.	*Model Y* Rs.
Estimated Life	5 years	6 years
Cost of machine	1,50,000	2,50,000
Cost of Indirect materials	6,000	8,000
Estimated savings in scrap	10,000	15,000
Additional cost of maintenance	19,000	27,000
Estimated savings in direct wages :		
Employees not required	150	200
Wages per employee	600	600

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Taxation to be regarded 50% of profit before charging depreciation. Which model would you recommend ? *(C. A. Final)*

Solution :

PROFITABILITY STATEMENT

		Model X		*Model Y*
		Rs.		*Rs.*
Estimated Saving per annum :				
Scrap		10,000		15,000
Wages		90,000		1,20,000
		(150×600)		(200×600)
Total Savings		1,00,000		1,35,000
Less : Additional Cost :				
Cost of Indirect Material	6,000		8,000	
Cost of Maintenance	19,000		27,000	
		25,000		35,000
Additional Earnings before tax		75,000		1,00,000
Less : Tax @ 50%		37,500		50,000
Annual Cash flow		37,500		50,000
Less : Depreciation $\left(\frac{1,50,000}{5}\right)$		30,000	$\left(\frac{2,50,000}{6}\right)$	41,667
Net Increase in earnings		7,500		8,333
Pay-back period	Cost of Machine / Annual Cash Flow	1,50,000 / 37,500		2,50,000 / 50,000
		4 years		*5 years*
		Model X		*Model Y*
Rate of Return on Investment		$\frac{7,500}{1,50,000} \times 100$		$\frac{8,333}{2,50,000} \times 100$
		= 5%		= 3.3%

As pay-back period in case of Model X is less than that in case of Model Y and also the return on Investment is higher in case of Model X, Model X is recommended.

Problem 21.6. The Tamil Nadu Fertilizers Ltd. is considering a proposal for the investment of Rs. 5 lakhs on product development which is expected to generate net cash inflows for 6 years as under :

Years	*Net Cash Flows (Rs. in thousands)*
1	Nil
2	100
3	160
4	240
5	300
6	600

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The following are the present value factors @ 15% per annum

Year 1	0.87
2	0.76
3	0.66
4	0.57
5	0.50
6	0.43

The Company's cost of capital is 15%. Advise the company on the desirability or otherwise of accepting the proposal.

(M. com. Madras)

Solution :

CACLULATION OF NET PRESENT VALUE

Years	*Cash Inflows (Rs. 000)*	*P. V. Factor @ 15%*	*Present Values (Rs.'000)*
1	Nil	0.87	Nil
2	100	0.76	76.00
3	160	0.66	105.60
4	240	0.57	136.80
5	300	0.50	150.00
6	600	0.43	258.00
			726.40
		Less : Cash Outlay	500.00
		Net Present Value	226.40

As the net present value is positive, 226.40 the proposal is acceptable.

Proble. 21.7. A project costing Rs. 10 lakhs has a life of 10 years at the end of which its scrap value is likely to be Rs. 1 lakh. The firm's cut off rate is 12%. The project is expected to yield an annual profit after tax of Rs. 1 lakh, dpreciation being charged on straight line basis. At 12% p.a., the present value of one rupee received annually for 10 years is Rs. 5.650 and the value of one rupee received at the end of 10 years is 0.322.

As certain the net value of the project and state whether we should go for the project.

Solution

CALCULATION OF NET PRESENT VALUE

			Rs.
Annual Profit after tax			1,00,000
Add : Depreciation $\left(\frac{10,00,000 - 1,00,000}{10}\right)$			90,000
Annual cash Inflow			1,90,000
Year	*P. V. Factor*	*Cash Inflows*	*Present Value*
1 – 10	5.650	1,90,000	10,73,500
10	0.322	1,00,000	32,200
		Total	11,05,700
		Less : Cash Outlay	10,00,000
		Net Present Value	1,05,700

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As the Net Present Value is+ve, we can go ahead with the project.

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Problem 21.8. Following are the pay-offs of three investment projects :

Project	*Current Pay-off*	*1st year Pay-off*	*2nd year Pay-off*
X	3,000	6,000	—
Y	3,000	2,000	4,000
Z	3,000	3,000	3,000

(i) Clculate the pay-back period of each investment assuming that Rs. 3,000 loss in the current year represents the cost of the project.

(ii) With the internal rate of 10% calculate net present value of each project.

(iii) Which project is best on each criteria ?

(The Present value of Re. 1 received during the 1st and 2nd years is .9516 and .8611 respectively) *(A.C.S. Final)*

Solution :

(i) **PAY-BACK PERIOD :**

Project X = $3000 \div 6{,}000 = \frac{1}{2}$ year.

Project Y = $1 \text{ year} + \frac{1{,}000}{4{,}000} = 1\frac{1}{4}$ year

(as it pays back Rs. 2,000 in the first *i.e.* Rs. 1,000 less than the cost of the project and Rs. 4,000 in the 2nd year)

Project Z = 1 year

(ii) **CALCULATION OF NET PRESENT VALUE :**

Year	*Discount Factor @ 10%*	*Cash Inflows*			*Present Values*		
		X Rs.	*Y* Rs.	*Z* Rs.	*X* Rs.	*Y* Rs.	*Z* Rs.
1	.9516	6,000	2,000	3,000	5,709.60	1,903.20	2,854.80
2	.8611	–	4,000	3,000	–	3,444.40	2,583.30
			Total Present Values		5,709.60	5,347.60	5,438.10
			Less : Cash Outflow		3,000.00	3,000.00	3,000.00
			Net Present Value		2,709.60	2,347.60	2,438.10

(iii) Project X is the best under both methods as it has the shortest pay-back period and the highest net present value.

Problem 21.9. The paritculars relating to two alternative capital projects are furnished below :

Life of the Project	*Project X* 4 years	*Project Y* 6 Years
Estimated Cash Outflow	15	15
Estimated Cash Inflow		
1st Year	8	7
2nd year	10	8
3rd Year	7	8
4th Year	3	6
5th Year	—	5
6th Year	—	4

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Compute' Internal rate of return' of Projects X and Y and state which project would you recommend. You may use the present value tables given below :

Present Value of Rupee 1

After Years	20%	25%	30%	35%	40%	45%	50%
1st	.833	.800	.769	.741	.714	.690	.677
2nd	.694	.640	.592	.549	.510	.476	.444
3rd	.579	.512	.455	.406	.364	.328	.296
4th	.482	.410	.350	.301	.260	.226	.198
5th	.402	.328	.269	.223	.186	.156	.132
6th	.335	.262	.207	.165	.133	.108	.088

(A C. .S. Final)

Solution :

Let us take arbitrary discount rate of 35%, 40% and 45% to calculate the I.R.R. by hit and trial method.

* Depreciation has been calculated as :

$(3,00,000 - 25,000) \times 10/55 = 50,000$

$\times\ 9/55 = 45,000$

$\times\ 8/55 = 40,000$

and so on.

CALCULATION OF I. R. R. FOR PROJECT X

Years	*Cash Inflows* Rs.	*P.V. Factor @ 35%*	*P.V. at* Rs. 35%	*P.V. Factor @ 40%*	*P.V. at 40%* Rs.
1	80,000	.741	5,92,800	.714	5,71,200
2	10,00,000	.549	5,49,000	.510	5,10,000
3	7,00,000	.406	2,84,200	.364	2,54,800
4	3,00,000	.301	90,300	.260	78,000
			15,16,300		14,14,000
		Less : Cash Outlay	15,00,000		15,00,000
			(+) 16,300		(–) 86,000

From the above table it is clear that the I. R. R. falls in between 35% and 40% as the Present Value of Rs. 15,00,000 falls in between these two rates of discount. The exact I. R. R. is

$$= 35\% + \left(\frac{16,300}{1,02,300} \times 5\right)$$

$= 35.8\%$

CALCULATION OF I.R.R. PROJECT Y

Years	Cash Inflows Rs.	P. V. Factor @ 35%	P. V. at 35% Rs.	P. V. Factor @ 40%	P. V. at 40% Rs.	P. V. Factor @ 45%	P. V. at 45% Rs.
1.	7,00,000	.741	5,18,700	.714	4,99,800	.690	4,83,000
2.	8,00,000	.549	4,39,200	.510	4,08,000	.476	3,80,800
3.	8,00,000	.406	3,24,800	.364	2,19,200	.328	2,62,400
4	6,00,000	.301	1,80,000	.260	1,56,000	.226	1,35,600

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5.	5,00,000	.223	1,11,500	.186	93,000	.156	78,000
6.	4,40,000	.165	66,000	.133	53,200	.108	43,200
		Total	16,40,800		15,01,200		13,83,000
		Lss Cash Outlay	15,00,000		15,00,000		15,00,000
			1,40,800		1,200		(–) 1,17,000

From the above table it is clear that the I. R. R. is between 40% to 45% as the Present Value Rs. 15,00,000 falls in between these two rates of discounts.

The exact I.R.R. is :

$$40\% + \left(\frac{1,200}{1,18,200} \times 5 \right)$$

$= 40.05\%$

Comparing the Internal Rate of Return of Projects X (35.8%) and Project Y (40.05%), Project Y is recommended as it gives a higher rate of return.

Problem 21.10. The financial manager of a company has to advise the board of directors on choosing between two compelling project proposals which require an equal investment of Rs. one lakh and are expected to generate cash flows as under :

		Project I	*Project II*
		Rs.	*Rs.*
End of year	1	48,000	20,000
	2	32,000	24,000
	3	20,000	36,000
	4	Nil	48,000
	5	24,000	16,000
	6	12,000	8,000

Which project proposal should be recommended and why ? Assume the cost of capital to be 10% p.a. The following are the present value factors at 10% per anum :

Year	1	2	3	4	5	6
Factor	0.909	0.826	0.751	0.683	0.621	0.564

(M. Com. Madras)

Solution :

CALCULATION OF NET PRESENT VALUE

Year	*Project I Net Cash Inflows*	*Project II Net Cash Inflows*	*P.V. Factor @ 10%*	*P. V. of Project I*	*P. V. of Project II*
	Rs.	*Rs.*		*Rs.*	*Rs.*
1	48,000	20,000	0.909	43.632	18,180
2	32,000	24,000	0.826	26,432	19,824
3	20,000	36,000	0.751	15,020	27,036
4	Nil	48,000	0.683	Nil	32,784
5	24,000	16,000	0.621	14,904	9,936
6	12,000	8,000	0.564	6,768	4,512
				1,06,756	1,12,272
			Less : Cash Outlay	1,00,000	1,00,000
				6,756	12,272

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As the Net Present Value of Project II is more than that of Project I, Project II should be accepted.

Problem 21.11. A firm whose cost of capital is 10% is considering two mutually exclusive projects X and Y the details of which are :

	Project X	Project Y
	Rs.	Rs.
Investment	70,000	70,000
Cash flow year 1	10,000	50,000
Cash flow year 2	20,000	40,000
Cash flow year 3	30,000	20,000
Cash flow year 4	45,000	10,000
Cash flow year 5	60,000	10,000
Total Cash Flows	2,35,000	2,00,000

Compute the net present value at 10%, profitability index and internal rate of return for the two projects.

Note :

Year	10%	15%	20%	25%	30%	35%	40%
1	.909	.870	.833	.800	.769	.741	.714
2	.826	.756	.694	.640	.592	.559	.510
3	.751	.658	.579	.512	.455	.406	.364
4	.683	.572	.482	.410	.350	.301	.260
5	.621	.497	.402	.328	.269	.223	.186

(Adapted C. A. Final)

Solution :

(a) **CALCULATION OF NET PRESENT VALUE**

Year	P. V. Factor at 10%	Project X		Project Y	
		Cash Inflows	Present Value	Cash Inflows	Present Value
		Rs.	Rs.	Rs.	Rs.
1	.909	10,000	9,090	50,000	45,450
2	.826	20,000	16,520	40,000	33,040
3	.751	30,000	22,530	20,000	15,020
4	.683	45,000	30,735	10,000	6,830
5	.621	60,000	37,260	10,000	6,210
Total		165,000	1,16,135	1,30,000	1,06,550
Less : Initial Cash Outflow			70,000		70,000
Net Present Value			46,135		36,550

(b) **CALCULATION OF PROFITABILITY INDEX**

$$\text{Profitability Index} = \frac{\text{Present Value of Cash Inflows}}{\text{Present Value of Cash Outflows}}$$

$$\text{Project X :} \quad = \frac{1,16,135}{70,000} = 1.66$$

$$\text{Project Y :} \quad = \frac{1,06,550}{70,000} = 1.52$$

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(c) CALCULATION OF INTERNAL RATE OF RETURN PROJECT X

Year	*Cash Inflows*	*P. V. Factor at 25%*	*Present Value*	*P. V. Factor at 30%*	*Present Value*
		Rs.		*Rs.*	*Rs.*
1	10,000	.800	8,000	.769	7,690
2	20,000	.640	12,800	.592	211,840
3	30,000	.512	15,360	.455	13,650
4	45,000	.410	18,450	.350	15,750
5	60,000	.328	19,680	.269	16,140
			74,290		65,070

Present value @ 25% is Rs. 74,290, but the cost of the project is Rs. 70,000 and hence internal rate of return is higher than 25%. But the present value @ 30% is 65,070 which is lower than the cost of the project. Hence internal rate of return is in between 25% and 30%. The exact internal rate of return is :

$$= 25\% + = \frac{74,290 - 70,000}{74,290 - 65,070} \times (30 - 25)$$

$$= 25\% + \frac{4,290}{9,220} \times 5$$

$$= 27.33\%$$

PROJECT Y

Year	*Cash Inflows*	*P. V. Factor at 35%*	*Present Value*	*P. V. Factor at 40%*	*Present Value*
	Rs.		*Rs.*		*Rs.*
1	50,000	.741	37,050	.714	35,700
2	40,000	.549	21,960	.510	20,400
3	20,000	.406	8,120	.364	7,280
4	10,000	.301	3,010	.260	2,600
5	10,000	.223	2,230	.186	1,860
			72,370		67,840

Hence, Internal Rate of Return :

$$= 35\% + = \frac{72,370 - 70,000}{72,370 - 67,840} \times (40 - 35)$$

$$= 35\% + \frac{2,370}{4,530} \times 5$$

$$= 37.62\%$$

Problem 21.12. A company manager is considering three projects which are mutually independent and any of them can independently be selected. The company has necessary funds but cannot take up more than one project.

The overall cost of the capital of the company is 10%. Expected cash flows from the projects are given below :

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Project Investment Required	*Cash Flows*				
	Year 1	*Year 2*	*Year 3*	*Year 4*	*Year 5*
A Rs. 10,000	12,000	3,000	–	–	–
B Rs. 14,000	–	–	10,000	5,000	7,000
C Rs. 9,000	–	4,000	5,000	5,000	2,000

You are required to advise the management as to which project it should take up giving the reasons for your advice.

Solution :

The cost of the three projects is different, the profitability index (present value index) method will be the best to evaluate the profitability of these projects :

CALCULATION OF PRESENT VALUE OF CASH FLOWS

Project 1 :

Year	Cash Flows *Rs.*	P. V. Factor at 10% *Rs.*	Present Value
1	12,000	0.909	10.908
2	3,000	0.826	2,478
			13,386
Project 2 :			
3	10,000	0.751	7,510
4	5,000	0.683	3,415
5	7,000	0.621	4,347
			15,272
Project 3 :			
2	4,000	0.826	3,304
3	5,000	0.751	3,755
4	5,000	0.683	3,415
5	2,000	0.621	1,242
			11,716

CALCULATION OF PROFITABILITY INDEX

$$\text{Profitability Index} = \frac{\text{Present value of Cash Inflows}}{\text{Present value of Cash Outflows (cost of the project)}}$$

$$\text{Project 1 : (P.I.)} = \frac{13,386}{10,000} = 1.339$$

$$\text{Project 2 : (P.I.)} = \frac{15,272}{14,000} = 1.091$$

$$\text{Project 3 : (P.I.)} = \frac{11,716}{9,000} = 1.302$$

As Profitability Index of Project 1 is the highest, the management is advised to take up Project No. 1

Problem 21.13. A company is considering the purchase of the two machines with the following details :

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	Machine 1	*Machine 2*
Life (estimated)	3 years	3 years
	Rs.	Rs.
Capital Cost	10,000	10,000
Net earning after tax		
1st year	8,000	2,000
2nd year	6,000	7,000
3rd year	4,000	10,000

You are required to suggest which machine should be preferred using :

1. Pay-back period method
2. Return on Investment method
3. Discounted Cash flow method

Solution :

1. **Pay-back Period**

Machine 1. In the first year Rs. 8,000 of the original cost is recovered and the balance of Rs. 2,000 is recovered in the 2nd year.

The pay-back period is :

$$= 1 + \frac{2,000}{6,000} \text{ years}$$

$$= 1.33 \text{ years.}$$

Machine 2. In the first two years Rs. 9,000 of the original cost is recovered and the balance of Rs. 1,000 is recovered in the 3rd year. Hence, the pay-back period is :

$$= 2 + \frac{1,000}{10,000} \text{ years}$$

$$= 2.1 \text{ years.}$$

2. **Return on Investment :**

Machine 1. Total earnings are Rs. 18,000 and the cost of the machine is Rs. 10,000 and hence net return is return is Rs. 8,000.

$$\text{Return on Investment} = \frac{8,000}{10,000} \times 1,000 = 80\%$$

Similarly,

$$\textit{Machine 2.} \quad \text{Return on Investment} = \frac{9,000}{10,000} \times 1,000 = 90\%$$

3. **Discounted Cash Flow**

CALCULATION OF NET PRESENT VALUE

		Machine 1		*Machine 2*	
Year	*Cash inflow*	*P. V. Factor*	*Present Value*	*Cash low*	*Present Value*
	Rs.		*Rs.*	*Rs.*	*Rs.*
1	8,000	0.909	7,272	2,000	1,818
2	6,000	0.826	4,956	7,000	5,782
3	4,000	0.751	3,004	10,000	7,510
			15,232		15,110
	Less : Cost of Machine		10,000		10,000
	Net present value		5,232		5,110

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According to pay-back period method, Machine I should be preferred as pay-back period for Machine 1 is 1.33 years which is less than 2.1 years for machine 2.

According to return on investment method, Machine 2 seems to be better as return on investment for Machine 2 is 90% which is higher than 80% for machine 1.

According to Discounted Cash Flow Method, again Machine 1 should be preferred as net present value is Rs. 5,232 which is higher than Rs. 5,110 in case of Machine 2.

Problem 21.14. Capital and Countries Ltd. is considering two projects, only one of which can be accepted. The data in respect of these two are given as below :

	Project I	*Project II*
	Rs.	*Rs.*
Outlay at t = 0	10,000	50,000
Net Inflows		
t = 1	5,000	10,000
t = 2	5,000	15,000
t =3	3,000	25,000
t = 4	2,000	25,000
t = 5	1,500	21,000

Calculate :

(i) the pay-back period ;

(ii) the excess present value at 10% ; and

(iii) the internal rate of return.

Also suggest which project should be selected by the firm. *(M. Com. Delhi)*

Solution :

(i) **Pay-back period :**

Project I

Total Cash Outlay = Rs. 10,000

Cash Inflows (for first 2 years) = 5,000 + 5,000 = 10,000

Hence, pay-back period = 2 years.

Project II

Total Cash Inflows (for first 3 years) = Rs. 50,000 = 10,000 + 15,000 + 25,000 = 50,000

Hence, pay-back period = 3 years.

(ii) **Excess Present Value :**

CALCULATION OF EXCESS (NET) PRESENT VALUE AT 10%

	Project I			*Project II*		
Years	*Cash Inflows*	*P.V. of Re. 1 @ 10%*	*P. V. of Inflows*	*Cash Inflows*	*P.V. of Re. 1 @ 10%*	*P. V. of Inflows*
	Rs.		*Rs.*	*Rs.*		*Rs.*
1	5,000	.909	4,545.00	10,000	.909	9,090..00
2	5,000	.826	4,130.00	15,000	.826	12,390.00
3	3,000	.751	2,253.00	25,000	.751	18,775.00
4	2,000	.683	1,366.00	25,000	.683	17,075.00
5	1,500	.621	931.50	21,000	.621	13,041.00
			13,225.50			70,371.00
	Less : Capital Outlay		10,000.00			50,000.00
	Excess Present Value		3,225.50			20,371.00

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(iii) **Internal Rate of Return :**

Since at 10% discount rate, there is an excess present value of Rs. 3,225.50 and Rs. 20,371.00, let us try a higher discount rate, say 20% and 26% for Project I and 22% 24% for Project II.

(Project I :

CALCULAIONS OF INTERNAL RATE OF RETURN

Years	*20% Discount Factor*			*26% Discount Factor*		
	Cash Inflows	*P. V. of Re.*	*P. V. of Cash Inflows*	*Cash Inflows*	*P. V. of Re. 1*	*P. V. of Cash Inflows*
	Rs.		*Rs.*	*Rs.*		*Rs.*
1	5,000	.833	4,165	5,000	.794	3,970
2	5,000	.694	3,470	5,000	.630	3,150
3	3,000	.579	1,737	3,000	.500	1,500
4	2,000	.482	964	2,000	.397	794
5	1,500	.402	603	1,500	.315	473
			10,939			9,887
		Less : Cost	10,000			10,000
		Excss : P. V.	939			–113

The present values of Cash Inflows @ 20% is Rs. 10,939 and @ 26% is Rs. 9,887 ; hence Internal Rate of Return is

$$= 20\% + \left(\frac{26 - 20}{939 + 113} \times 939 \right) = 20\% + 5.35.\%$$

$$= 25.35\%$$

Project II

Years	*22% Discount Factor*			*24% Discount Factor*		
	Cash Inflows	*P. V. of Re. 1*	*P. V. of Cash Inflows*	*Cash Inflows*	*P. V. of Re. 1*	*P. V. of Cash Inflows*
	Rs.		*Rs.*	*Rs.*		*Rs.*
1	10,000	.820	8,200	10,000	.806	8,060
2	15,000	.672	10,080	15,000	.650	9,750
3	25,000	.551	13,775	25,000	.524	13,100
4	25,000	.541	11,275	25,000	.423	10,575
5	21,000	.370	7.770	21,000	.341	7,161
			51,100			48,646
		Less : Cost	50,000			50,000
		Excess P. V.	1,100			–1,354

$$\text{Internal Rate of Return} = 22\% + \left(\frac{24 - 22}{1{,}100 + 1{,}354} \times 1{,}100 \right)$$

$$= 22\% + \frac{2}{2{,}454} \times 1{,}100$$

$$= 23\% \text{ Appx.}$$

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Problem 21.15. The following statements give quantitative considrations relevant for the ranking of Projects A and B :

Criteria	*Project A*	*Project B*
	Rs.	*Rs.*
Investment	400	300
Internal Rate of Return	Nearly 18%	Nearly 20%
Present value at 6% discount factor	542.7	421.2
Net Present value at 6% D. F.	142.7	121.2
Net present value at 12% D. F.	60.5	60.5

Project A required an investment of Rs. 400 and was expected to have cash inflow of Rs. 110, Rs. 120, Rs. 130, Rs. 140 and Rs. 150 over its five years economic life. Project B involved an investment of Rs. 300 and was expected to have cash inflows of Rs. 100 each over its five-year economic life.

Which of the two projects will you select if cost of capital is *(i)* 10% *(ii)* 12% and *(iii)* 15% ? Give reasons in support of your decision. *(C. A. Final, Nov.)*

Solution :

Net Present value at 12% cost of capital is given to be 60.5 for Projects A and B both. But as Project B requires lesser cash outlay, it should be preferred at 12% D. F.

CALCULATION OF NT PRESENT AT 10% AND 15%

Project A

Year	*Cash Inflows*	*P.V. Factor @ 10%*	*P.V. Factor @ 15% Rs.*	*P. V. at 10% Rs.*	*P. V. at 15%*
1	110	.909	.870	99.99	95.70
2	120	.826	.756	99.12	90.72
3	130	.751	.658	97.63	85.54
4	140	.683	.572	95.62	80.08
5	150	.621.	.497	93.15	74.55
				485.51	426.59
	Less : Initial Cash Outlay			400.00	400.00
	Net Present Value			85.51	26.59

Project B :

Years	*Cash Inflows Rs.*	*P. V. Factor @ 10%*	*P. V. Factor @ 15%*	*P. V. at 10% Rs.*	*P. V. at 15% Rs.*
1–5	100 pr annum	3.790	3.353	379	335.30
	Less : Initial Cash Outlay			300	300.00
		Net Present Value		79	35.30

At 10% cost of capital, Project A should be preferred as it gives a higher Net Present Value as compared to Project B. But if the cost of capital is 15% Project B should be preferred for the same reasons.

Problem 21.16. X Company Ltd. manufactures a component which is used in the televisions which they manufacture and sell. The quantity required is 14,000 units.

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The direct cost of manufacturing this component is Rs. 8/- per unit. The company has received a proposal from ABC Ltd. to meet their entire needs at Rs. 10/- per unit. If X company discontinues making this component it can use its existing facilities for manufacturing a new product for sale for Rs. 20/- per unit which would involve the following :

Investment in new machine (which has a life of 80,000 hours) Rs. 1,60,000. Material cost will be Rs. 6 and direct labour cost Rs. 4 per unit. Indirect expenses (other than depreciation) for 16,000 machine hours-Rs. 48,000. Estimated sales-16,000 units. Should the proposal to buy the component at Rs. 10/- per unit be accepted if their current cut off rate is -*(a)* 25% and *(b)* 40%

Solution :

Cost of New Investment = Rs. 1,60,000

Calculation of Profitability of New Investment :

		Rs.
Sales of 16,000 units @ Rs. 20/- per unit		3,20,000
Less : Cost of sales	*Rs.*	
Material @ Rs. 6/- per unit	96,000	
Labour @ Rs. 4/- per unit	64,000	
Indirect Expenses	48,000	
Depreciation (Rs. 2/- per hour)	32,000	2,40,000
Profit		80,000
Less : Additional cost of purchasing the component 14,000 × 2		28,000
Net Earnings		52,000

$$\text{Return of Investment} = \frac{52,000}{1,60,000} \times 100$$

$$= 32.5\%$$

The proposal to purchase the component should be acceptd if the cut-off rate is 25% but off rate of 40% the proposal should be rejected as return on investment is only 32.5%.

Poblem 21.17. The following two Projects A and B require an invstment of Rs. 2,00,000 each. The income returns after taxes for these projects are as follows :

Years	*Project A*	*Project B*
1	80,000	20,000
2	80,000	40,000
3	40,000	40,000
4	20,000	40,000
5	—	60,000
6	—	60,000

Using the following criteria, determine which of the projects is preferable :

(i) 8 years pay-back,

(ii) Average Rate of Return,

(iii) Present Value approach if the company's cost of capital is *(a)* 10% and *(b)* 6%

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Solution :

(i) **Pay-back Period :**

Project A :

Cash Inflows for 1st 3 years = Rs. 80,000 + 80,000 + 40,000
= Rs. 2,00,000

Cash Outlay = Rs. 2,00,000

Hence, Pay-back period = 3 years

Project B :

Cash Inflows for first 5 years = Rs. 20,000 + 40,000 + 40,000 + 40,000 + 60,000
= Rs. 2,00,000

Cash Outlay = Rs. 2,00,000

Hence, Pay-back period = 5 years.

Using the criteria of 8 years pay-back, both the projects are acceptable. But if one is to be selected, according to pay-back period method, Project A having 3 years pay-back should be preferred to Project B having 5 years.

(ii) **Average Rate of Return :**

Project A :

Total Returns = Rs. 80,000 + 80,000 + 40,000 + 20,000
= Rs. 2,20,000

Average Return $= \frac{2,20,000}{4}$ = Rs. 55,000

Net Cash Outlay of the project = Rs. 2,00,000

Average Rate of Return $= \frac{55,000}{2,00,000} \times 100$
= 27.5%

Project B :

Total Returns = Rs. 20,000 + 40,000 + 40,000 + 40,000 + 60,000 + 60,000
= Rs. 2,60,000

Average Return $= \frac{2,60,000}{6}$ = Rs. 43,333

Average Rate of Return $= \frac{43,333}{2,00,000} \times 100$
= 21.5%

As the average rate of return of Project A is higher than of Project B, Project A should be preferred.

(iii) **CALCULATION OF PRESENT VALUES**

Project A

Years	*Cash Inflows Rs.*	*P. V. Factor @ 10%*	*P. V. Fac. @ 6%*	*P. V. at 10% Rs.*	*P. V. at 6% Rs.*
1	80,000	.909.	.943	72,720	75,440
2	80,000	.826	.890	66,080	71,200
3	40,000	.751	.840	30,040	33,600
4	20,000	.683	.792	13,660	15,840
				1,82,500	1,96,080
			Less : Cash Outlay	2,00,000	2,00,000
			Net Present Value	– 17,500	– 3,920

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Project B

Years	Cash Inflows Rs.	P. V. Factor @ 10%	P. V. Factor @ 6%	P. V. at 10% Rs.	P. V. at 6% Rs.
1	20,000	.909	.943	18,180	18,860
2	40,000	.826	.890	33,040	35,600
3	40,000	.751	.840	30,040	33,600
4	40,000	.683	.792	27,320	31,680
5	60,000	.621	.747	37,260	44,820
6	60,000	.564	.705	33,840	42,300
				1,79,680	2,06,860
		Less : Cash Outlay		2,00,000	2,00,000
		Net Present Value		–20,320	+ 6,860

If the company's cost of Capital is 10 percent, no project is acceptable as none has + ve Net Present Value. At 6% Cost of Capital Project B should be preferred as it has + ve Net Present Value of Rs. 6,860.

Problem 21.18. Modern Electronics Co. Ltd. are considering the purchase of a machine. Two machines A and B are available, each costing Rs. 50,000. In comparing the profitability of these machines a discount rate of 10% is to be used. Earnings after taxation are expected to be as follows :

Year	*Machine A Cash Inflow*	*Machine B Cash Inflow*
1	15,000	5,000
2	20,000	15,000
3	25,000	20,000
4	15,000	30,000
5	10,000	20,000

You are also given the following data :

Year hence	*Present Value of Re. @ 10% discount*
1	0.909
2	0.826
3	0.751
4	0.683
5	0.621

Evaluate the projects using :

(a) the pay-back period,

(b) the accounting rate of return,

(c) the net present value and the profitability index.

Solution :

(a) **PAY-BACK**

Machine A : Cash Outlay = Rs. 50,000

Cash Inflows for first 2 years = Rs. 15,000 + 20,000
= Rs. 35,000

Cash Inflows for first 3 years = Rs. 15,000 + 20,000 + 25,000
= Rs. 60,000

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Hence, Pay-back period = 2 year + $\frac{15,000}{25,000}$

= 2.6 years.

Machine B : Cash outlay = Rs. 50,000

Cash Inflows for first 3 years = Rs. 5,000 + 15,000 + 20,000

= Rs. 40,000

Cash Inflows for first 4 years = Rs. 5,000 + 15,000 + 20,000 + 30,000

= Rs. 70,000

Hence, Pay-back period = 3 years + $\frac{10,000}{30,000}$

= 3.33 years.

As the pay-back period of machine A is less than that of Machine B, Machine A should be purchased.

(b) **ACCOUNTING RATE OF RETURN**

Machine A :

Total Returns = Rs. 15,000 + 20,000 + 25,000 + 15,000 + 10,000

= Rs. 85,000

Average-Returns = $\frac{85,000}{5}$ = Rs. 17,000

Average Rate of Return = $\frac{17,000}{50,000} \times 100 = 34\%$

Machine B :

Total Return = Rs. 5,000 + 15,000 + 20,000 + 30,000 + 20,000

= Rs. 90,000

Average Return = $\frac{90,000}{5}$ = Rs. 18,000

Average Rate of Return = $\frac{18,000}{50,000} \times 100 = 36\%$

According to accounting rate of return method, Machine B should be preferred as it gives a higher average rate of return.

(c) (i) **CALCULATION OF NET PRESENT VALUES**

Years	*P. V. Factor at 10%*	*Cash Inflows Machine A Rs.*	*Cash Inflows Machine B Rs.*	*P. Values Machine A Rs.*	*P. V. Machine B Rs.*
1	0/909	15,000	5,000	13,635	4,545
2	0.826	20,000	15,000	16,250	12,390
3	0.751	25,000	20,000	18,775	15,020
4	0.683	15,000	30,000	10,245	20,490
5	0.621	10.000	20,000	6,210	12,420
				65,385	64,865
			Less : Cash Outlay	50,00	50,000
			Net present Value	15,385	14,865

Assuming Net Present Value of Machine A is more than that of Machine B, Machine A should be purchased.

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(c) (ii) **PROFITABILITY INDEX**

$$\text{Machine A} = \frac{\text{Present Values}}{\text{Cost of Investment}} = \frac{65,385}{50,000} = 1.308$$

$$\text{Machine B} = \frac{64,865}{50,000} = 1.297$$

Profitability Index of Machine A is more than that of Machine B and hence, machine A should be preferred.

Problem 21.19. The Jai company provides ferry service across the Ganga river. One of its ferry boats is in poor condition. The ferry boats can be renovated at an immediate cost of Rs. 20,000. Further repairs and over haul of the motor will be needed five years from now at a cost of Rs. 8,000. In all, the ferry will have to be scrapped at a salvage value of approximately Rs. 5,000. The scrap value of the ferry right now is Rs. 7,000. It will cost Rs. 16,000 each year to operate the ferry. As an alternative, Jai company can purchase a new ferry boat at a cost of Rs. 40,000. It will have a life of 10 years, but will also require some repairs at the end of five years. It is estimated that these repairs will amount to Rs. 2,500. At the end of 10 years, it is estimated that the ferry will have a scrap value of Rs. 5,000. It will cost Rs. 12,000 each year to operate the ferry. Company requires a return of at least 18% on all investment. Should the company purchase the new ferry or renovate the old ferry ? *(C. A. Final)*

Solution :

CALCULATION OF NET PRESENT VALUE OF CASH OUTFLOWS

First Alternative-Repairs :

	Year	*Cash Outflows*	*Discount Factors @ 18%*	*Present valuse*
		Rs.	*Rs.*	*Rs.*
Cost of Renovation	0	20,000	1.000	20,000
Repair and Overhaul	5	8,000	0.437	3,496
Operating Cost	1 to 10	16,000 (p.a.)	4.494	71,904
				95,400
Less : Salvage value	10	5,000	0.191	955
Net Present value of Outflows				94,445

Second Alternative—Purchase

	Year Cash	*Outflows*	*Discount Factor*	*Present values*
		Rs.	*Rs.*	*Rs.*
Net cost of New boat (40,000–7,000)	0	33,000	1.000	33,000
Repairs	5	2,500	0.437	1,092
Operating cost	1 to 10	12,000 (p.a.)	4.494	53,928
				88,020
Less : Salvage value	10	5,000	0.191	955
				87,065

As the Net Present value of Outflows of Rs. 87,065 in case of purchase alternative is less than NPV of outflows of Rs. 94,445 of repair alternative, purchase alternative is to be prefered.

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Problem 21.20. The Philips Corporation, which has 50 per cent tax rate and a 10 per cent after tax cost of capital, is evaluating a project which will cost Rs. 1,00,000 and will require an increase in the level of inventories and receivables of Rs. 50,000 over of its life. The project will generate additional sales of Rs. 1,00,000 and will require cash expenses of Rs. 30,000 in each year of its five year life ; it will be depreciated on a straight-line basis. What is the net present value and internal rate of return for the project.

(M. Com., Delhi)

Solution :

Cash Outflows :

	Rs.
Cost of New Project	1,00,000
Additional Working Captal required in the form of inventories and receivables	50,000
Total Cash Outlays	1,50,000

Calculation of Cash Inflows (per annum) :

		Rs.
Sales		1,00,000
Less : Cash Expenses	30,000	
Depreciation	20,000	
		50,000
		50,000
Less : Tax @ 50%		25,000
Earnings after tax		25,000
Add back Depreciation		20,000
Net Cash Inflows		45,000

Net Cash Inflows shall be Rs. 45,000 per annum. In the fifth year additional Rs. 50,000 will be released from working capital and hence inflows in the 5th year shall be Rs. 45,000 + 50,000 = Rs. 95,000

CALCULATION OF NET PRESENT VALUE

Years	*Cash Inflows* Rs.	*Discount Factor @ 10%*	*Present values*
1 – 4	45,000	3.170 (From P. V. Annuity Tables)	1,42,650
5	95,000	0.621 (From P. V. Tables)	58,995
			2,01,645
		Less : Cash Outlay	1,50,000
		Net Present Value	51,645

CALCULATION OF INTERNAL RATE OF RETURN

As the net present values @ 10 per cent discount factor is Rs. 51,645. We try a higher rate of discount, say 20 percent and 22 percent.

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Years	Cash Inflows Rs.	Discount Factor @ 20%	Present values at 20% Rs.	Dis. Factor @ 22%	P. V. at 22% Rs.
1–4	45,000	2.5887	1,16,481	2.4936	1,12,212
5	95,000	0.402	38,190	0.703	35,150
			1,54,671		1,47,362
		Less : Cash Outlay	1,50,000		1,50,000
			4,671		–2,638

$$\text{Hence, I.R.R} = 20\% + \left(\frac{2}{4,631 + 2,638} \times 4,671\right)\%$$

$$= 20\% + \frac{2}{7,309} \times 4,671\%$$

$$= 20\% + 1.27\%$$

$$= 21.27\%$$

Problem.21.21. One of the largest and most profitable companies in the country is faced with the prospect of having to replace a large stamping machine. Two machines currently being marketed will do the job satisfactorily. The superior stamping machine costs Rs. 50,000 and will require cash running expenses of Rs. 20,000 per year. The Pearless Machine costs Rs. 75,000 but running expenses are only expected to be Rs. 15,000 pr year. Both machies have a 10 year useful life with no salvage value and would be depreciated on straight line method.

(a) If the company pays a 50% tax and has a 10% after-tax required rate of return, which machine should it purchase ?

(b) Would your answer be different if the required rate of return was 8% ?

(M. Com. Delhi)

Solution :

The Pearless machine requires an extra investment of Rs. 25,000 compared to Superior stamping machine, but the running expenses of Pearless machine are lower by Rs. 5,000 per annum. To arrive at a conclusion, we should calculate the Net Present Value of Cash Inflows from Pearless machine.

CALCULATION OF CASH INFLOWS (SAVINGS) PER ANNUM

	Before tax Rs.	After tax @ 50% Rs.
Savings in cost (per annum).		
Lower Running Expenses	5,000	2,500
Depreciation (7,500 – 5,000)	2,500	1,250
		3,750

(a) **CALCULATION OF NET PRESENT VALUE AT 10%**

Year	Cash Inlfows Rs.	Discount Factor @ 10%	Present Value Rs.
1 – 10	3,750	6.145	23,043.75
Less :	Additional Cash Outlay (75,000 – 50,000)		25,000.00
Net Present Value			–1,956.25

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As the Net present Value is negative, the Pearlss machine should not be purchased. The company should purchase the superior Stamping machine.

(b) **CALCULATIONS OF NET PRESENT VALUE AT 8%**

Year	*Cash Inflows* Rs.	*Discount Factor @ 8%*	*Present Values* Rs.
1 – 10	3,750	6.710	25,162.50
Less :	Additional Cash Outlay (75,000 – 50,000)		25,000.00
Net Present Value			162.50

At 8% discount factor, the net present value is positive and it is advised to purchase Pearless Machine.

Problem 21.22. A computer is available at a cash purchase price of Rs. 4,40,000. If taken on hire the charges would be Rs. 15,400 per month for a minimum base of 36 months, and thereafter the rate would be reducd to Rs. 7,500 per month. The rentals fall due for payment at the end of each month.

A company planning to acquire the above Computer wants advice whether it would be more economical to purchase the machine or take it one hire. What would be your advice if the cost of capital is to be taken at 10% per annum ? The present values of Re. 1 and Re. 1/2 paid monthly, at the end of 6 years both at 10% are as follows :

After Year (n)	*Present value of Re. 1/2 paid monthly*	*Present value of Re. 1*
1	0.950	0.909
2	0.864	0.826
3	0.785	0.751
4	0.714	0.683
5	0.649	0.621
6	0.591	0.564

Solution :

CALCULATION OF PRESENT VALUES OF CASH OUTFLOWS

Years	*1* Rs.	*2* Rs.	*3* Rs.	*4* Rs.	*5* Rs.	*6* Rs.
(A) *Purchase of Computer* Cash Outflows	4,40,000					
in beginning						
End of year	44,000	44,000	44,000	44,000	44,000	44,000
(10%) Discount Factor	.909	.826	.751	.683	.621	.564
P. V. of Cash Outflow	4,40,000 +39,996	36,344	33,044	30,052	27,324	24,816
Cumulative P. V. (a)	4,79,996	5,16,340	5,49,384	5,79,436	6,06,760	6,31,576
(B) *Hiring of Computer* Cash Outflow	1,84,800	1,84,800	1,84,000	90,000	90,000	90,000
Discount Factor	.950	.864	.785	.714	.649	.591

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P. V. of Cash outflows	1,75,560	1,59,667	1,45,068	64,260	58,410	53,190
Cumulative P. V. (b)	1,75,560	3,35,227	4,80,295	5,44,555	6,02,965	6,56,155
Difference (a – b)	3,04,436	1,81,113	69,089	34,881	3,795	– 24,579

The table reveals that the difference in the present values of outflows in the 5th year is nominal and from 6th years onwards the outflows for hiring are more than purchase. Hence, if the life of computer is more than 5 years, it is advised to purchase.

Problem 21.23. An oil company proposes to instal a pipeline for transport of crude oil from wells to refinery. Invstments and Operating costs of the pipeline vary for differnt sizes of pipes (diameter). The following details have been collected ;

Pipeline dia-meter	3"	4"	5"	6"	7"
Investment (Rs. lakhs)	16	24	36	64	150
Gross annual savings in operating costs before depreciation and tax (Rs. lakhs)	5	8	15	30	50

Estimated life of the installation s 10 years. The rate is 50%. Ignore investment allowance. Calculate the net savings after the cash flow generations, from these recommend the largests pipeline to be installed if the company desires 15 per cent after tax rate return. Also indicate the proposal that has the shortest payback.

(I. C. W. A. Final)

Solution :

CALCULATION OF NET SAVINGS AFTER TAX AND CASH FLOW GENERATIONS *(Rs. in lakhs)*

Size	3"	4"	5"	6"	7"
Gross Annual Savings	5.00	8.00	15.00	30.00	50.00
Less : Depreciation @ 10%	1.60	2.40	3.60	6.40	15.00
Saving after dpreciation	3.40	5.60	11.40	23.60	35.00
Less tax at 50%	1.70	2.80	5.70	11.80	17.50
(1) Net savings after tax	1.70	2.80	5.70	11.80	17.50
(2) Cash flow generations (Net savings after tax and depreciation)	3.30	5.20	9.30	18.20	32.50
Investment	16	24	36	64	1.50
(3) 15% Return on Investment	2.40	3.60	5.40	9.60	22.50
(4) Surplus above 15% (1–3)	(–) 0.70	(–) 0.80	0.30	2.20	(–) 5.00
(5) Pay-back period =	16 / 3.30 = 4.86	24 / 5.20 = 4.26	36 / 9.30 = 3.87	64 / 18.20 3.52	150 / 32.50 = 4.62

Recommendation

6" diameter pipeline gives the largest surplus *i.e.* Rs. 2.20 lakhs above 15 per cent required return on investment, and has also the shortest pay-back period of 3.52 years and hence, 6" diameter pipeline is recommended to be installed.

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Problem 21.24. A company is setting up a project at a cost of Rs. 300 lakhs. It has to decide whether to locate the plant in Forward Area (FA) or Backward Area (BA). Locating in Backward Area means a cash subsidy of Rs. 15 Lakhs from Central Govt. Besides, the taxable profit to the extent of 20% is exempted for 10 years. The project envisages a borrowing of Rs. 200 lakhs in either case. The cost of borrowing will be 12% in Forward Area, 10% in Backward Area. However, the revenue costs are bound to be higher in Backward Area. The borrwings have to be repaid in 4 equal annual instalments beginning from the end of the 4th year. With the help of following information and by using DCF Techniques you are required to suggest the proper location for the project :

	Profit (Loss) before interest and depreciation (Rs. in lakhs)		*Present value Factor at 15%*
		F. A.	*B. A.*
1	(6.00)	(50.00)	0.87
2	34.00	(20.00)	0.66
3	54.00	10.00	0.66
4	74.00	20.00	0.57
5	108.00	45,00	0.50
6	142.00	100.00	0.43
7	156.00	155.00	0.38
8	230.00	190.00	0.33
9	330.00	230.00	0.28
10.	430.00	330.00	0.25

The annual depreciation may be taken at Rs. 30 lakhs. Interest on borrowings may be worked out at the respective rates. Average rate of tax may be taken at 50%.

(C. A. Final)

Solution :

CALCULATION OF CASH INFLOWS

Forward Area : *(Rs. in lakhs)*

Year	*Profit (Loss before interest and dep.*	*Dep.*	*Interest*	*Profit (Loss) after int. after int. and dep.*	*Income tax*	*Profit (Loss) after tax*	*Cash Inflow (profit after tax before depre-ciation*
1	(6.00)	30.00	24.00	(60.00)	—	(60.00)	Nil
2	34.00	30.00	24.00	(20.00)	—	(20.00)	10.00
3	54.00	30.00	24.00	Nil	—	Nil	30.00
4	74.00	30.00	24.00	20.00	—	20.00	50.00
5	108.00	30.00	18.00	60.00	—	60.00	90.00
6	142.00	30.00	12.00	100.00	50.00	50.00	80.00
7	156.00	30.00	6.00	120.00	60.00	60.00	90.00
8	230.00	30.00		200.00	100.00	100.00	130.00
9	330.00	30.00		300.00	150.00	150.00	180.00
10	430.00	30.00		400.00	200.00	200.00	230.00

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Backward Area

Year	*Profit (Loss) before interest and dep.*	*Dep.*	*Interest*	*Profit (Loss) after int. and dep.*	*Income tax*	*Profit (Loss) after tax*	*Cash Inflow (profit after tax befor* dep.)*
1	(50.00)	30.00	20.00	(100.00)	—	(100.00)	—
2	(20.00)	30.00	20.00	(70.00)	—	(70.00)	—
3	10.00	30.00	20.00	(40,00)	—	(40.0)	—
4	20.00	30.00	20.00	(30.00)	—	(30.00)	—
5	45.00	30.00	15.00	Nil	—	Nil	30.00
6	100.00	30.00	10.00	60.00	—	60.00	90.00
7	155.00	30.00	5.00	120.00	—	120.00	150.00
8	190.00	30.00		160.00	40.00*	120.00	150.00
9	230.00	30.00		200.00	80.00	120.00	150.00
10.	330.00	30.00		300.00	120.00	180.00	210.00

(*) *8th year Income-tax :*

Profit before-tax :	160.00
Less : Previous year losses not written off	60.00
	100.00
Less : Exemption 20%	20.00
Net Profit	80.00
Tax @ 50%	40.00

CALULATION OF NET PRESENT VALUES

As the rate of interest is 12% and 10% the P. V. discount factor has been assumed @ 15%

Forward Area *(Rs. in lakhs)*

Year	*Cash Inflow*	*P. V. Factors @ 15%*	*Present Values*
1	—	0.87	—
2	10.00	0.76	7.60
3	30.00	0.66	19.50
4	50.00	0.57	28.50
5	90.00	0.50	45.00
6	80.00	0.43	34.40
7	90.00	0.38	34.20
8	130.00	0.33	42.90
9	180.00	0.28	50.40
10	230.00	0.25	57.50
		Total P. V. of Inflow	320.30

Less : P. V. of cash Outflows :		
Initial Investment (300 – 200)	100.00	
P. V. of cash loss in 1st year (6.00 + 24.00) = 30.00 × .87	26.1	
		126.10
Net Present Value		194.20

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Backward Area :

(Rs. in lakhs)

Year	*Cash Inflows*	*P. V. Factor @ 15%*	*Present Values*
1	—	0.87	—
2	—	0.76	—
3	—	0.66	—
4	—	0.57	—
5	30.00	0.50	15.00
6	90.00	0.43	38.70
7	150.00	0.38	47.00
8	150.00	0.33	49.50
9	150.00	0.28	42.00
10	210.00	0.25	52.50
		Total P. V. of Inflows	244.70

Less : P. V. of Cash Outflows :		
Initial Investment (300. – 200 – 15)	85.00	
P. V. of cash loss in 1st year : (50 + 20) = 70 × .87	60.90	
P. V. of cash loss in 2nd year : (20 + 20) = 40 × .76	30.40	
P. V. of cash loss in 3rd year : (20 – 10) = 10 × .66	6.60	
		182.90
Net Present Values		61.80

The Net Present Value of Cash Inflows in Forward Area is + 194.20 while in Backward Area it is only + 61.80. Hence, it is suggested that the plant should be located in Forward Area.

Problem 21.25. A company has the choice of countinuously making a product on its existing machine or obtaning one of the two alternative machines in lieu. The following details are avalable in respect of these machines :

	Machines		
	Present	*E*	*F*
Book Value (Rs.)	50,000	—	—
Resale Value now (Rs.)	55,000	—	—
Purchase Price (Rs.)	—	90,000	1,00,000
Fixed Cost p.a. (Rs.) (including depreciation)	46,000	54,000	66,000
Variable running costs (Rs.) per unit (including labour)	1.50	0.75	1.25
Units produced per hour	8	8	12
Additional data are as follows :			
Selling Price per unit (Rs.)	10		
Material Cost per unit (Rs.)	5		
Annual Operating Hours	2,000		
Life of each machine (as from now)	5 years		
Residual Value of machines	Nil		

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Depreciation was calculated by straight line method using book value or purchase price as the cas my be. The sales manager believes that the production from the present machine or machine E can all be sold without further expenditure but that an extra Rs. 4,000 p.a. will need to be spent on advertising to sell the extra production given by machine F. Assuming that the rate of tax is 50% and that the cost of finance is 9%, evaluate the projects using Net Present Value method. The P. V. of Re. 1 (to be received at the end of the year at 9%) is given below :

Year	1	2	3	4	5
P. V.	.92	.84	.77	.71	.65

(M. Com. Calcutta)

Solution :

CALCULATION OF CASH INFLOWS FOR THE THREE MACHINES

		Present	*E*	*F*
		Rs.	*Rs.*	*Rs.*
(a)	Sales @ Rs. 10/- unit	1,60,000	1,60,000	2,40,000
(b)	*Less :* Cost of Sales			
	Material @ Rs. 5/- unit	80,000	80,000	1,20,000
	Variable running cost	24,000	12,000	30,000
	Fixed Cost	46,000	54,000	66,000
	Extra Advertising Cost	—	—	4,000
		1,50,000	1,46,000	2,20,000
(c)	Profit (a-b) before tax	10,000	14,000	20,000
(d)	*Less :* Tax @ 50%	5,000	7,000	10,000
(e)	Profit after tax (c - d)	5,000	7,000	10,000
(f)	*Add :* Depreciation	10,000	18,000	20,000
(g)	Profit after tax but before depreciation (Net Cash Inflows)	15,000	25,000	30,000

CALCULATION OF NET PRESENT VALUES

		Present Machine		*Machine E*		*Machine F*	
Year	*P. V. factor @ 9%*	*Cash Inflows*	*P. V.*	*Cash Inflows*	*P. V.*	*Cash Inflows*	*P. V.*
		Rs.	*Rs.*	*Rs.*	*Rs.*	*Rs.*	*Rs*
1	.92	15,000	13,800	25,000	23,000	30,000	27,600
2	.84	15,000	12,600	25,000	21,000	30,000	25,200
3	.77	15,000	11,550	25,000	19,250	30,000	23,100
4	.71	15,000	10,650	25,000	17,750	30,000	21,300
5	.65	15,000	9,750	25,000	16,250	30,000	19,500
			58,350		97,250		1,16,700
		Less cost of Investment	55,000		90,000		1,00,000
		Net Present Value	3,350		7,250		16,700

According to the Net Present Value Method, Machine F should replace the present machine as it gives the highest net present value.

But as the cost of investment is different for all the three alternatives, it is better to calculate Profitability Index.

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$$\text{Present Machine} = \frac{58,350}{55,000} = 1.06$$

$$\text{Machine E} = \frac{97,250}{90,000} = 1.08$$

$$\text{Machine F} = \frac{1,16,700}{1,00,000} = 1.17$$

Also the P. I. of Machine F is the highest and hence Machine F should replace the existing machine.

Problem 21.26. A company is considering two mutually exclusive projects. Project K will require an initital cash investment in machinery of Rs. 2,68,000. It is anticipated that the machinery will have a usful life of ten years at the end of v'hich its salvage will realise Rs. 20,500. The project will also require an additional investment in cash, sundry debtors and stock of Rs. 40,000. At the end of five years from the commencement of the project balancing equipment for Rs. 45,000 has to be installed to make the unit workable. The cost of additional machinery will be written off to depreciation over the balance life of the project. The project is expected to yield a net cash flow (before depreciation) of Rs. 1,00,000 annually.

Project R, which is the alternative under consideration, requires an investment of Rs. 3,00,000 in machinery and as in salvage value of the machinery at the end of its useful life of ten years is expected to be Rs. 25,000. The annual cash inflow (before depreciation) from the project is worked at Rs. 80,000 p.a. for the first five years and Rs. 1,80,000 per annum for the next years.

Depreciation is written off by the company on sum-of-digits method, *(i.e.* if the life of the asset is 10 years, then in the ratio of 10, 9, 8 and so on). Income tax rate is 50%. A minimum rate of return objective has been calculated at 16%. The present value of Re. 1 at interest of 16% p.a. is.86, 74, .64, .55, 48, .41, .35, .30, .26. 23 for 1 to 10 years respectively. Which project is better ? Assuming no capital gains taxes, calculate the Net Present value of each project. *(C. A. Final)*

Solution :

CALCULATION OF NET PRESENT VALUE OF PROJECT K

Years	*Cash Inflows before dep.*	*Dep. **	*Profit before tax*	*Income tax @ 50%*	*Net Cash Inflows (after tax + dep.)*	*P. V. Factor @ 16%*	*Present values*
	Rs.	*Rs.*	*Rs.*	*Rs.*	*Rs.*		*Rs.*
1	1,00,000	45,000	55,000	27,500	72,500	.86	62,350
2	1,00,000	40,500	59,500	29,750	70,250	.74	51,985
3	1,00,000	36,000	64,000	32,000	68,000	.64	43,520
4	1,00,000	31,500	68,500	34,250	65,750	.55	36,163
5	1,00,000	27,000	73,000	36,500	63,500	.48	30,480
6	1,00,000	37,500	62,500	31,250	68,750	.41	28,188
7	1,00,000	30,000	70,000	35,000	65,000	.35	22,750
8	1,00,000	22,500	77,500	38,750	61,250	.30	18,375
9	1,00,000	15,000	85,000	42,500	57,500	.26	14,950
10	1,00,000	7,500	92,500	46,250	53,750.	23	12,362
10 (Salvage Value plus Current Assets)	60,500 (20,500 + 40,000)	—	—	—	60,500	.23	13,915
						Total Present Value	3,35,048

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Less : Cash Outlauy intial Investment	2,68,000	
P. V. of Additional Investment at the end of 5 years (45,000 × .48)	21,600	
Additional Initial Investment in current assets	40,000	
		3,29,600
Net Present Value		5,438

CALCULATION OF NET PRESENT VALUE OF PROJECT R

Years	*Cash Inflows before Dep.*	*Dep.*	*Profit before income tax*	*Income tax @ 50%*	*Net Cash Inflows (after tax before dep.*	*P. V. Factor @ 16%*	*P. V.*
	Rs.	*Rs.*			*Rs.*	*Rs.*	*Rs.*
1	80,000	50,000	30,000	15,000	65,000	.86	55,900
2	80,000	45,000	35,000	17,500	62,500	.74	36,250
3	80,000	40,000	40,000	20,000	60,000	.64	38,400
4	80,000	35,000	45,000	22,500	57,500	.55	31,625
5	80,000	30,000	50,000	25,000	55,000	.48	26,400
6	1,80,000	25,000	1,55,000	77,500	1,02,500	.41	42,025
7	1,80,000	20,000	1,60,000	80,000	1,00,000	.35	35,000
8	1,80,000	15,000	1,65,000	82,500	97,500	.30	29,250
9	1,80,000	10,000	1,70,000	85,500	95,000	.26	24,700
10	1,80,000	5,000	1,75,000	87,750	92,500	.23	21,275
10 (Salvage Value plus Current Assets)	65,000 (25,000+ 40,000)	—	—	—	65,000	.23	14,950
					Total Present Value		= 3,65,775

* Depreciation has been calculated as (2,68,000 – 20,500) × 10/55 ; × 9/55 and so on. From fifth year onwards additional depreciation on 45,000 × 5/15, × 4/15, × 3/15 and so on.

Total Present Value		3,65,775
Less : Cash Outlay	3,00,000	
Additional Investment in Currnt Assets	40,000	
		3,40,000
Net Present Value		25,775

As the net present value of Project R is much higher than that of K, Project R is a better investment.

Problem 21.27. A company is considering the replacement of its existing machine by new one. A consultant who has charged Rs. 25,000 supplies the company with following information in that regard :

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New Machine :

Cost price, Rs. 25 lakhs, installation charges Rs. 10,000, working life 10 years, book value at the end of the working life Rs. 20,000, disposable value at the end of the 10th year Rs. 10,000, annual savings in running expenses (after tax) Rs. 5 lakhs, investment allowance available in the first year 25% of the cost price.

Existing Machine

Current book value Rs. 5 lakhs and market value Rs. 4 lakhs.

the new machine would require additional working capital of Rs. 35,000. Worker's training for handling the new machine cost Rs. 5,000. The company pays income-tax @ 50% and its cost of capital is 20%.

Compute the cash flows and advise if the new machine should be bought.

Note PVs of Re. 1 at 20% discount rate are as follows :

Year	1	2	3	4	5	6	7	8	9	10
P. V.	.833	.694	.579	.482	.402	.335	.279	.233	.194	.162

(I..C.W.A. Final ; C. A. Final)

Solution :

Calculation of Initial Cash Outflows

		Rs.
(i)	*Intial Cash Outflow on pruchase of new machine :*	
	Cost Price	25,00,000
	Add : Installation charges	10,000
	Total Cost	25,10,000
	Less : Sale Value of existing machine	4,00,000
	Net Cash Outflow on purchase of new machine	21,10,000
(ii)	Cash Outflow for additional working Capital	35,000
(iii)	Cash Outflow for wc.kers	5,000
	Total Intial Cash Outflows	21,50,000

Calculation of Present Value of Cash Inflows and N.P.V.

	Rs.
Tax benefit at the end of year 1 on account of investment allowance @ 50% $(25,00,000 \times \frac{25}{100} \times \frac{50}{100}) = 3,12,500$	
Present Value of tax benefit on investment allowance $(3,12,500 \times 0.833)$ at the end of the year 1	2,60,312
Present value of tax benefit on installation charges as investment allowance is claimed on cost price of machine $(10,000 \times \frac{50}{100} \times 0.833)$ at the end of year 1	4,165
Present value of tax benefit on training cost of workers $(5000 \times \frac{50}{100} \times 0.833)$ at the end of year 1	2,083
Present value of annual savings from 1 to 10 years $(5,00.000 \times 4.193)$	20,96,500
Present value of disposable value of new machine at the end of 10th year $(10,000 \times 0.162)$	1,620
P. V. of Recovery of additional working capital at the end of 10th year $(35,000 \times 0.162)$	5,670

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P. V. of tax benefit on the loss of disposal of new machine at the end of 10th year $[(20,000 - 10,000) \times \frac{50}{100} \times 0.162]$	810
Total Present Value of Cash Inflows	23,71,160
Less : Present value of Cash Outflows	21,50,000
Net Present Value	2,21,160
As the Net Present Value is positive, the new machine should be bought.	

Working Notes and Assumptions :

1. Present Value of Re. 1 received annually for 10 years @ 20% is 4.193
2. Consultant fees of Rs. 25,000 is a sunk cost and hence not considered in cashflow calculations
3. Tax benefit on loss on sale of old machine has not been considered.
4. It is assumed that investment allowance is allowed on cost price of the machine and hence installation charges and workers' training expenses have been considered as revenue expenses.

Problem 21.28. Due to a considerable risk inherent in a project costing an initial cash outflow of Rs. 20,000 a firm decides to use certainty equivalents to evaluate the Project. The certainty equivalents have been estimated to be 0.8, 0.7, 0.6, 0.5, 0.4 in a period of 5 years. The risk free rate of interest is 10%. The expected values of cash inflows are given below :

Years	Cash Inflows
	Rs.
1	5,000
2	8,000
3	8,000
4	6,000
5	12,000

You are required to advise the firm whether its management should accept the Project.

Solution :

CALCULATION OF ADJUSTED CASH INFLOWS

Years	*Expected Cash Inflows*	*Certainty Equivalent*	*Adjusted Cash Inflows*
	Rs.		*Rs.*
1	5,000	0.8	4,000
3	8,000	0.7	5,600
3	8,000	0.6	4,800
4	6,000	0.5	3,000
5	12,000	0.4	4,800

CALCULATION OF NET PRESENT VALUE

Year	*Adjusted Cash Inflows*	*P. V. Factor @ 10%*	*Present Value @ 10%*
1	4,000	0.909	3,636
2	5,600	826	4,626

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3	4,800	0.751	3,605
4	3,000	0.683	3,049
5	4,800	0.621	2,981
		Total Present Value	16,897
		Less : Cash Outlay	*20,000*
		Net Present Value	*(–) 3,103*

As the adjusted net value of the Project is-ve (Rs. 3,103), the Project should be rejected.

Problem 21.29. Two mutually exclusive investment proposals are being considered. The following information is available :

	Project A	*Project B*
	Rs.	*Rs.*
Cost	12,000	12,000
Life	2 years	2 years
Cash Flow each year	8,000	8,000
Salvage value	Nil	Nil

Upon further analysis it was found that the cost of the project is a certain amount and so is the life of the project. However, the probabilities of cash inflow each year for Project A and B are as follows :

Project A		*Project B*	
Possible Inflow	*Probability*	*Possible Inflow*	*Probability*
	Rs.		*Rs.*
4,000	.2	7,000	.2
8,000	.6	8,000	.6
12,000	.2	9,000	.2

Assuming cost of Capital at 10%, advise the selection of the project.

(C. A. Final)

Solution :

CALCULATION OF ADJUSTED NET PRESENT VALUE

Project A :

Years	*Possible Inflows*	*Probability*	*Adjusted Inflows*	*P. V. Factor @ 10%*	*Present Value*
	Rs.		*Rs.*		*Rs.*
1	4,000	.2	800	.909	727
2	8,000	.6	4,800	.826	3,965
3	12,000	.2	2,400	.751	1,802
				Total Present Values	6,494
				Less : Cash Outlay	12,000
				Net Present Value	(–) 5.506

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Project B :

Year	Possible Inflows	Probability	Adjusted Inflows	P. V. Factor at 10%	Present Value
	Rs.		Rs.		Rs.
1	7,000	.2	1,400	.909	1,273
2	8,000	.6	4,800	.826	3,965
3	9,000	.2	1,800	.751	1,352
			Total Present Values		6,590
			Less : Cash Outlay		12,000
			Net Present Value		(–) 5,410

As Adjusted Net Present Value (for probability) is negative for both the projects, both the projects should be rejected.

Problem 21.30. A project costs Rs. 150 to initiate. After one year it could return 130 with probability .7 or 90 with probability .3. If the 130 return materialises then there is a .4 chance of a return of 120 and a .6 chance of a return of 70 after two years. If the return of 90 occured in the first year, then the probability distribution of returns in year 2 is 130 with a probability of .5 and 100 with probability .5. Assuming that a 10% rate of discount is employed, find the expected net present worth of the project. *(C. A. Final)*

Solution :

Cost of Investment = Rs. 150

Cash Inflows : There are four possibilies :

	Year	*Inflows*	*Probability*
(1)	1	130	0.7 × 0.4 = 0.28
	2	120	
(2)	1	130	0.7 × 0.6 = 0.42
	2	70	
(3)	1	90	0.3 × 0.5 = 0.15
	2	130	
(4)	1	90	0.3 × 0.5 = 0.15
	2	100	

CALCULATION OF NET PRESENT VALUES

(1)	*Year*	*Cash Inflows*	*P. V. Factor @ 10%*	*Present Values*
		Rs.		*Rs.*
	1	130	0.909	118.17
	2	120	0.826	99.12
		Total P. V.		217.29
		Less : Cash Outlay		150.00
		Net P. V.		67.29
(2)	1	130	0.909	118.17
	2	70	0.826	57.82
		Total P. V.		175.99
		Less : Cash Outlay		150.00
		Net P. V.		25.99

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(3)	1	90	0.909	81.81
	2	130	0.826	107.38
		Total P.V.		189.19
		Less : Cash Outlay		150.00
		Net P. V.		39.19
(4)	1	90	0.909	81.81
	2	100	0.826	82.60
		Total P. V.		164.41
		Less : Cash Outlay		150.00
				14.41

CALCULATION OF ADJUSTED NET PRESENT VALUES

	Net P. V.	*Proability*	*Adjusted Net P. V.*
1	67.29	0.28	18.84
2	25.99	0.42	10.92
3	39.19	0.15	5.88
4	14.41	0.15	2.16
Expected Net Present Worth of the Project			37.80

Problem 21.31. Swastik Ltd. manufacturers of special purpose machine tools, have two divisions which are periodically assisted by visiting teams of consultants. The management is worried about the steady icrease of expenses in this regard over the year. An analysis of last year's expenses reveals the following :

	Rs.
Consultant's Remuneration	2,50,000
Travel and Conveyanve	1,50,000
Accomodation Expenses	6,00,000
Boarding Charges	2,00,000
Special Allowances	50,000
	12,50,000

The management estimates accomodation expenses to increase by Rs. 2,00,000 annually.

As part of a cost reduction drive Swastik Ltd. are proposing to construct a consultancy centre to take care of the accomodation requirements of the consultants. This centre will additionally save the company Rs. 50,000 in boarding charge and Rs. 2,00,000 in the cost of Executive Training Programmes hitherto conducted outside the company's premises, every year.

The following details are available regarding the construction and maintenance of the new centre :

(a) Land : at a cost of Rs. 8,00,000 already owned by the company, will be used.

(b) Construction cost Rs. 15,00,000 including special furnishings.

(c) Cost of annual maintenance : Rs. 1,50,000

(d) Construction cost will be written off over 5 years being the useful life.

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Assuming that the write – off of construction cost as aforesaid will be accepted for tax purposes, that the rate of tax will be 50% and the desired rate of return is 15% ; you are required to analyse the feasibility of the proposal and make recommendations.

The relevant Present Value Factors are :

Year	—	1	2	3	4	5
P. V. Factor	—	0.87	0.76	0.66	0.57	0.50

(C. A. Final)

Solution :

COMPUTATION OF NET PRESENT VALUE

Years	0	1	2	3	4	5
					(Rs. in lakhs)	
(a) Cost of Construction (Intial Cash Outflow)	(15)	—	—	—	—	—
(b) Savings						
(i) Accommodation Expenses		8	10	12	14	16
(ii) Boarding Charges		0.5	0.5	0.5	0.5	0.5
(iii) Execcutive Training		2	2	2	2	2
(c) Total Savings		10.5	12.5	14.5	16.5	18.5
(d) Less : Additional Cost of Maintainence		1.5	1.5	1.5	1.5	1.5
		9.0	11.0	13.0	15.0	17.0
(e) Less : Depreciation		3.0	3.0	3.0	3.0	3.0
(f) Savings Before Tax (SBT)		6.0	8.0	10.0	12.0	14.0
(g) Less : Tax @ 50%		3.0	4.0	5.0	6.0	7.0
ii) Savings After Tax (SAT)		3.0	4.0	5.0	6.0	7.0
(i) Cash Inflow (SAT + Dep ; *i.e.* (i) + (e)		6	7	8	9	10
(j) P. V. Factor at 15%		0.87	0.76	0.66	0.57	0.50
(k) P. V. of cash Inflows *(i × j)*		5.22	5.32	5.28	5.13	5.00
(l) Total P. V. of Cash Inflows (Year 1 to 5)		= 25.95				
(m) Net Present Value *[(l) – (a)]*		25.95 – 15 = 10.95				

Recommendations :

As the net present value is positive ; it is feasible to build the guest house.

Note :

(i) Land cost of Rs. 8,00,000 already owned by the company is a sunk cost and hence not relevant.

(ii) Consultant's remuneration, travel and conveyance and special allowance have been ignored as these will be incurred even after construction of guest house.

Problem 21.32. Modern Enterprises Ltd. is considering the purchase of a new computer system for its Research and Development Division, which would cost Rs. 35 lakhs. The operation and maintenance costs (excluding depreciation) are expected to be Rs. 7 lakhs per annum. It is estimated that the useful life of the system would be 6 years, at the end of which the disposal value is expected to be Rs. 1 lakh.

The tangible benefits expected from the system in the form of reduction in desigin and draughtsmanship costs would be Rs. 12 lakhs per annum. Besides, the disposal of used drawing office equipment and furniture, initially, is anticipated to net Rs. 9 lakhs.

Capital expenditure in research and development would attract 100% write off for tax purposes. The gains arising from disposal of used assets may be considered tax free. The company's effective tax rate is 50%.

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The average cost of capital to the company is 12%. The present value factors at 12% discount rate are :

Year	PVF
1	0.982
2	0.797
3	0.711
4	0.635
5	0.567
6	0.506

After appropriate analyis of cash flows, please advise the company of the financal viability of the proposal. *(C. A. Final)*

Solution :

(a) **Calculation of Initial cash Outflow in Zero year :** *(Rs. in lakhs)*

Cost of new computer system	35.00
Less : Net realisation on disposal of used office equipment and furniture	9.00
Net Cash Outflow in zero year	26.00

(b) **Calculation of Annual Cash Inflows :**

Reduction design and draughts manship costs	12.0
Less : Operation and maintenance costs	7.00
Savings Before Tax	5.00
Less : 50% Tax	2.50
Annual Cash Inflows (Savings After Tax)	2.50

(c) Savings in tax at the end of year 1 due to 100% write off of capital expenditure in R and D expenditure $\left(\frac{50}{100} \times 35\right)$ 17.50

(d) Cash Inflow at the end of year 6 from the disposal of new computer system. 1.00

COMPUTATION OF NET PRESENT VALUE

Year	*Outflow (Rs. lakhs)*	*Inflow (Rs. lakhs)*	*P. V. Flow*	*Present Value (Rs. lakhs)*
0	(26)	–	1	(26.00)
1	–	2.50 + 17.50 = 20.00	0.892	17.840
2	–	2.50	0.797	1.992
3	–	2.50	0.711	1.778
4	–	2.50	0.635	1.588
5	–	2.50	0.567	1.417
6	–	2.50+1.00=3.50	-.506	1.771
			Net Present Value	+0.386

Advice : As the net present value is positive ; the proposal can be accepted.

Problem 21.33. A Costmetic company is considering to introduce a new lotion which is useful both in winters and summers. The manufacturing equipment will cost Rs. 5,60,000. The expected life of equipment is 8 years. The company is thinking of

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selling the lotion in a single standard pack of 50 grams at Rs. 12 each pack. It is estimated that variable cost per pack would be Rs. 5 and annual fixed cost, Rs. 4,50,000. Fixed cost includes (straight line) depreciation of Rs. 70,000 and allocated overheads of Rs. 30,000. The company expects to sell 1,00,000 packs of lotion each year. Assume tax rate is 35% and straight line depreciation is allowed for tax purpose. The required rate of return is 15%. Calculate the time adjusted break-even point for project appraisal. The PV factor of an annuity of Re 1 for 8 years at 15% rate of discount is 4.487.

Solution :

(i) **Calculation of Annual After Tax Cash Flows**

= [Sales Units (Selling Price – Variable Cost) – Fixed Cost] × (1 – Tax Rate) + Depreciation

= [1,00,000 (12–5) – 4,20,000] × (1 – .35) + 70,000

= (7,00,000 – 4,20,000) × (.65) + 70,000

= 1,82,000 + 70,000 = Rs. 2,52,000

(ii) **Calculation of Net Present Value**

Present Value of Cash Inflows	= 2,52,000 × PVAF .15, 8
	= 2,25,000 × 4.487
	= Rs. 11,30,724
Less : Cash Outlay	= Rs. 5,60,000
Net Present Value (NPV)	Rs. 5,70,724

Note : Allocated overheads of Rs. 30,000 have been ignored as these are irrelevent and will be incurred whether or not the project is undertaken.

(iii) **Calculation of the Time-Adjusted Break-Even Point (Q)**

Net Present Value at BEP = 0.

Or, NPV = 0 = [Q (12–5) – 4,20,000] × (1 – .35) + 70,000] × 4.487 – 5,60,000

Or, 0 = [7Q × 0.65 – 4,20,000 × 0.65 + 70,000] × 4.487 – 5,60,000

Or, 0 = [4.55 Q – 2,73,000 + 70,000] × 4.487 – 5,60,000

0 = 20.41585 Q = 9,10,861 – 5,60,000

Or, 20.41585 Q = 0 + 9,10,861 + 5,60,000

$$Q = \frac{14,70,861}{20.41585}$$

= 72,045 packs.

Thus, Time Adjusted Break-Even Point is 72,045 packs,

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22

Lease Financing

Problem 22.1. An equipment costing Rs. 5,00,000 with a five-year life, can be leased for 5 years for payments of 1,20,000 per year at the end of each year. Alternatively you can borrow Rs. 5,00,000 and buy the equipment. 6% interest is payment on the outstanding balance at the close of each year, the principal being repayable in 5 equal instalments.

You are to compute depreciation at 20% on the original cost p.a. Corporate tax is to be reckoned at 50% and a fair return of 10% after tax is expected on the business funds. The present value factors for discounting at 10% are as below :–

Year 1-0.909
Year 2–0.826
Year 3-0.751
Year 4 – 0.683
Year 5 – 0.621

Present your choice, with comparative analysis.

(I. C. W. A. Final)

Solution :

COMPUTATION OF PRESENT VALUE OF CASH OUT FLOWS UNDER LEASE

Year	*Hire Charges*	*Tax Benefit*	*Net Cash Outflow*	*P.V. Factor*	*P.V. of*
	(Rs.)	*(50%)Rs.*	*Rs.*	*at 10%*	*Cash Outflows Rs.*
1	1,20,000	60,000	60,000	0.909	54,540
2	1,20,000	60,000	60,000	0.826	49,560
3	1,20,000	60,000	60,000	0.751	45,060
4	1,20,000	60,000	60,000	0.683	40,980
5	1,20,000	60,000	60,000	0.621	37,260
Total Present value of cash Outflows					2,27400

COMPUTATION OF PRESENT VALUE OF CASH OUT FLOWS UNDER BORROWING AND BUYING

Year (1)	*Repayment of Loan* (2) Rs.	*Interest* (3) Rs..	*Depreciation at 20%* (4) Rs.	*Tax Benefit 50%of Int. Dep.* (5) Rs.	*Net Cash Outflows* (6=2+3-5) Rs.	*P.V. Factor at 10%*	*P.V. of Outflows* Rs.
1	1,00,000	30,000	1,00,000	65,000	65,000	0.909	59,085
2	1,00,000	24,000	1,00,000	62,000	62,000	0.826	51,212
3	1,00,000	18,000	1,00,000	59,000	59,000	0.751	44,309
4	1,00,000	12,000	1,00,000	56,000	56,000	0.683	38,248
5	1,00,000	6,000	1,00,000	53,000	53,000	0.621	32,913
Total Present value of cash Outflows*Year*							2,25,767

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Choice : As the P.V. of cash outflows in case of borrowing and buying is lesser; it is preferable to borrow and buy the equipment.

Problem 22.2. A computer is available at a cash purchase price of Rs. 4,40,000. If taken on hire, the charges would be Rs. 15,400 per month for a minimum period of 36 months, and therefter the rate would be reduced to Rs. 7,500 per month. The rentals fall due for payment at the end of each month.

A company, planning to acquire the above computer, wants advice whether it would be more economical to purchase the machine or take it on hire. What would be your advice if the cost of the capital is to be taken as 10% per annum. The present value of Rs. 1 and Rs. 1/12 paid monthly at the end of n years both at 10% are as follows :

After year (n)	*Present value of Rs. 1/12 paid monthly*	*Present value*
1.	0.950	0.909
2.	0.864	0.826
3.	0.785	0.751
4.	0.714	0.683
5.	0.649	0.621
6.	0.591	0.564

(C.A. Final)

Solution :

CALCULATION OF PRESENT VALUES OF CASH OUTFLOWS

Years	*1* Rs.	*2* Rs.	*3* Rs.	*4* Rs.	*5* Rs.	*6* Rs.
(A) Purchase of Computer						
Cash Outflows in beginning	4,40,000					
End of year (10%)	44,000	44,000	44,000	44,000	44,000	44,000
Discount Factor	.909	.826	.751	683	.621	.564
P.V. of Cash Outflow	4,40,000 +39,996	36,344	33,044	30,052	27,324	24,816
Comulative P.V.(a)	4,79,996	5,16,340	5,49,384	5,79,436	6,06,760	6,31,576
(B) Hiring of Computer						
Cash Outflow	1,84,800	1,84,800	1,84,800	90,000	90,000	90,000
Discount Factor	.950	.864	785	.714	.649	.591
P.V. of Cash outflows	1,75,560	1,59,667	1,45,068	64,260	58,410	53,190
Cumulative P.V. (b)	1,75,560	3,35,227	4,80,295	5,44,555	6,02,965	6,56,155
Difference (a-b)	3,04,436	181,113	69,089	34,881	3,795	-24.579

The table reveals that the difference in the present values of outflows in the 5th year is nominal and from 6th year onwards the outflows for hiring are more than purchase. Hence, if the life of computer is more than 5 years, it is advised to purchase.

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Problem22.3 RS Ltd is considering using a machine made by BC Ltd. The machine would cost Rs. 60,000 and at the end of a four year life is expected to have a resale value of Rs. 4,000, the money to be received in year 5. It would save Rs. 29,000 per year over the method that RS Ltd.currently uses. RS. Ltd expects to earn a DCF return of 20% before tax on this type of investment.

RS Ltd is currently earning good profits, but does not expect to have Rs. 60,000 available to spend on this machine over the next few years. It is subject to corporation tax at 35% and receives capital allowances of 25% on a reducing balance basis.

You are required to

(a) recommend whether, from an economic viewpoint, RS Ltd should invest in the machine from BC Ltd.

(b) calculate which of the following options RS Ltd. would be financially better off to adopt:

Option 1 Buy the machine and borrow the Rs. 60,000 from the bank, repaying at the end of each year a standard annual amount that would comprise principal and interest at 20% per annum;

or Option 2 Lease the machine for four years at an annual lease payment equal to the annual amount it would need to pay the bank under Option 1 above.

Show you calculations.

Note : Assume that lease payments or loan repayments are made gross at the end of each year and that tax is paid and tax allowances received one year after those profits are earned.

Working Notes :

1. It should be kept in mind that RS Ltd is already earning good profit. Capital allowance received by it will reduce its profit resulting in tax benefit @ 35%. Similarly capital loss at the end of 4th year will also reduce its profit, resulting in tax benefit.
2. DCF return of 20% before tax is equal to 13% after tax as is calculated below:

Suppose profit	=Rs. 100
Corporate tax	35
Profit after tax	65

∴ 20% of Rs. 65 =Rs. 13 or 13% after tax.

Solution :

(a) To recommend whether, from an economic point of view, R. S. Ltd. should invest in the machine from B. C. Ltd; we can compute the Net Present value of Cash flows. If the NPV of cash flows is positive, we should invest in this machine otherwise not.

COMPUTATION OF PRESENT VALUE OF CASH FLOWS

(Rs. in '000)

Year	Cost of Investment	Savings	Tax on savings @35%	Tax Benefit due to capital allowance reserve (as calculated below)	Net cash Flow	P.V. Factor at 13%	Present of cash Flows
(1)	(2)	(3)	(4)	(5)	(6=3-4+5)	(7)	(8=6¥7)
0	(60.0)	—	—	—	(60.0)	1.0	(60.0)
1	—	29.0	—	—	29.0	0.88	25.5
2	—	29.0	(10.15)	5.2	24.1	0.78	18.8
3	—	29.0	(10.15)	3.9	22.8	0.69	15.7
4	—	29.0	(10.15)	2.9	21.8	0.61	13.3
5	—	4.0	(10.15)	7.5	1.3	0.54	0.7
		(Result Value)			Net Present value of cash flows		14.0

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CALCULATION OF TAX BENEFIT DUE TO CAPITAL ALLOWANCE RESERVE AND CAPITAL LOSS

Year	Value of Asset at the beginning Rs.	Capital Allowance Reserve @25% Rs.	Tax Benefit due to Capital Allowance Reserve and capital Loss @35% Rs.	Reducing value of Asset at the end Rs.
1.	60,000	15,000	5,250	45,000
2.	45,000	11,250	3,938	33,750
3.	33,750	8,438	2,953	25,312
4.	25,312	6,328	2214	18,984
			5245	

Capital Loss = 18984 − 4000

Tax benefit = $14984 \times \frac{35}{100}$

Option (1) : Using bank borrowings for purchasing the machine

(i) Calculation of Loan Instalment :

$$\text{Loan Instalment} = \frac{\text{Amount of Loan}}{\text{P.V. Factor of Annuity}}$$

$$= \frac{60,000}{2.59}$$ (P.V. of an annuity of Re. 1 at 20% is 2.59)

= Rs. 23, 166

(ii) SCHEDULE OF LOAN PAYMENT

Year	Loan Balance at beginning of the year (Rs)	Loan Instalment (Rs.)	Interest Payment @ 20% (Rs.)	Principal Payment (Rs)	Loan Balance at the end of the year (Rs.)
1.	60,000	23,166	12,000	11,166	48,834
2.	48,834	23,166	9,767	13,399	35,435
3.	35,435	23,166	7,087	16,079	19,356
4.	19356	23,166	3,871	19295	

* The difference in the last year because of rounding off error.

(iii) COMPUTATION OF NET PRESENT VALUE OF CASH OUTFLOWS UNDER OPTION - 1

Year Col.1	Loan Instalment 2 (Rs)	Tax savings on Interest (Rs)	Capital Allowance Reserve/Loss (Rs)	Total (Rs)	Net cash Outflow 4=2-3 (Rs)	P.V. Factor at 13% 5	P.V. of Net Cash outflows 6
1	23,166	—	—		23,166	0.88	20,386
2	23,166	4,200	5250	9,450	13,716	0.78	10.698
3	23,166	3,418	3938	7,356	15,810	0.69	10,909
4	23,166	2,479	2,953	5,432	17,734	0.61	10,818
5	-4000	1385	7459	8,884	12,844	0.54	(-)6,920
(Resale value)			Present value of cash out flows				45,891

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(b) Option 2: Lease the machine for four years at Rs. 23166 p.a.

COMPUTATION OF NET PRESENT VALUE OF CASH OUTFLOWS OPTION - 2

Year	*Lease Rent* (Rs.)	*Savings in Tax on Lease rentals at 35%* (Rs.)	*Net Cash outflow* (Rs)	*P.V. Factor at 13%*	*P.V. of Cash outflows* (Rs.)
1.	23,166	—	23,166	0.88	20,386
2.	23,166	8,108	15,058	0.78	11,745
3.	23,166	8,108	15058	0.69	10,390
4.	23,166	8,108	15,058	0.61	9,186
5.	—	8,108	(-)8108	0.54	(-)4,378
	Net Present value of cash outflows				47,329

As Net Present value of cash outflows is lesser under option 1; it is better for R.S. Ltd. to borrow from bank and buy the machine.

Problem 22.4. An industrial unit desires to acquire a diesel generating set costing Rs. 20 lacs which has an economic life of ten years at the end of which the asset is not expected to have any residual value. The unit is considering the alternative choices of.

(a) taking the machinery on lease, or

(b) purchasing the asset outright by raising a loan.

Lease payments are to be made in advance and the lessor requires the asset to be completely amortised over its useful period and that the asset will yield him a return of 10%.

The cost of debt is worked at 16% per annum. Average rate of income-tax is 50%. It is expected that the operative costs would remain the same under either method.

The following factors may also be taken into account :

(i) The present value discount factors for even stream of cash flows over the number of years are :

Year	Rate of interest		
	8%	10%	16%
1	.93	.91	.86
2	1.78	1.74	1.60
3	2.58	2.49	2.25
4	3.31	3.17	2.80
5	3.99	3.79	3.27
6	4.62	4.35	3.68
7	5.20	4.87	4.04
9	5.75	.5.33	4.61
10	6.71	6.14	4.83

(ii) Straight line method of depreciation may be adopted.

(iii) Investment allowance will be eligible on investment.

As a financial consultant, indicate what your advice will be? Workings are to form part of your answer.

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Solution :

(a) Taking the machinery on lease :

$$\text{Annual Lease Payment} = \frac{\text{Cost of Asset}}{\text{Annuity Factor}}$$

$$= \frac{20,00,000}{1+5.76} = \frac{20,00,000}{6.76}$$

$$= \text{Rs. } 2.95,858.$$

COMPUTATION OF PRESENT VALUE OF CASH OUTFLOWS ALTERNATINE -(A) LEASE

Year	*Lease Payment* Rs.	*Savings in Tax @ 50%* Rs.	*Net cash Outflow* Rs.	*P.V. Factor @ 8%**	*P.V. of cash outflows* Rs.
0	2,95,858	—	2,95,858	1.00	2,95,858
1-9	2,95,858	1,47,929	1,47, 929	6.25	9,24,556
10	—	1,47,929	(-), 1,47,929	0.46	(-) 68,047
	Total Present Value of Cash Outflows				11,52,367

*As the cost of debt is given to be 16% p.a. and the rate of income tax is 50%; the after tax cost of debt is 8%

(b) Purchasing the machinery outright by raising a loan :

(i) Calculation of annual loan instalment

$$\text{Loan Instalment} = \frac{\text{Amount of Loan}}{\text{P.V. Factor of Annuity}}$$

$$= \frac{20,00,000}{1+4.61} = \frac{20,00,000}{5.61}$$

$$= \text{Rs. } 3,56,506.$$

(ii) Schedule of Loan Payment

Year	*Loan Balance at the begining*	*Loan Instalment*	*Interest Payment @ 16%*	*Principal Amount*	*Loan Balance at the end*
	(Rs.)	*(Rs.)*	*(Rs.)*	*(Rs.)*	*(Rs.)*
0	20,00,000	3,56,506	—	3,56,506	16,43,494
1	16,43,494	3,56,506	2,62,959	93,547	15,49,949
2	15,49,949	3,56,506	2,47,992	1,08,514	14,41,433
3	14,41,433	3,56,506	2,30,629	1,25,877	13,15,556
4	13,15,556	3,56506	2,10,489	1,46,017	11,59,539
5	11,59,539	3,56,506	1,87,126	1,69,380	10,00,159
6	10,00,159	3,56,506	1,60,025	1,96,481	8,03,678
7	8,03,678	3,56,506	1,28,588	2,27,918	5,75,760
8	5,75,760	3,56,506	92,122	2,64,384	3,11,376
9	3,11,376	3,61,196*	49,820	3,11,376	Nil

*The amount of loan instalment in the last year is different from the equal payments because of compensation for rounding error.

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(iii) Computation of Present value of cash Outflows under alternative (b) Purchasing the machinery by raising a loan.

End of year (1)	Loan Payment (2) Rs.	Interest @ 16% (3) Rs.	Depreciation (4) Rs.	Investment Allowance (5) Rs.	Saving in Tax (50% of 3+4+5 (6) Rs.	Net Cash Outflows (7) Rs.	P.V. Factor at 8% (8)	P.V. of Cash Outflows (9) Rs.
0	3,56,506	—	—	—	—	3,56,506	1.00	3,56,506
1	3,56,506	2,62,959	2,00,000	5,00,000	4,81,440	(-)1,24,974	0.97	(-)1,16,226
2	3,56,506	2,47,992	2,00,000	—	2,23,996	1,32,510	0.85	1,12,634
3	3,56,506	2,30,629	2,00,000	—	2,15,315	1,41,191	0.80	1,12,953
4	3,56,506	2,10,489	2,00,000	—	2,05,245	1,51,261	0.73	1,10,421
5	3,56,506	1,87,126	2,00,000	—	1,93,563	1,62,493	0.68	1,10,801
6	3,56,506	1,60,025	2,00,000	—	1,80,013	1,76,493	0.63	1,11,191
7	3,56,506	1,28,583	2,00,000	—	1,64,000	1,92,212	0.58	1,11,483
8	3,56,506	92,122	2,00,000	—	1,46,061	2,10,445	0.55	1,15,745
9	3,61,196	49,820	2,00,000	—	1,24,910	2,38,286	0.50	1,18,143
10	—	—	2,00,000	—	1,00,000	(-)1,00,000	0.46	(-)46,000
Present Value of total cash Outflows								10,97,651

Advice : As the present value of cash outflows under alternative (b) is lesser; the firm should purchase the asset by raising a loan.

Problem 22.5. Elite Builders, a leading construction company have been approached by a Foreign Embassy to build for them a block of six flats to be used as guest houses. As per the terms of contract the Foreign Embassy would provide Elite Builders the plans and the land costing Rs. 25 lakhs. Elite Builders would build the flats at their own cost and lease tham out to the Foreign Embassy for 15 years at the end of which the flats will be transferred to the Foreign Embassy for a nominal value of Rs. 8 lakhs. Elite Builders estimates the cost of construction as follows :

Area per flat	1,000 sq. ft
Construction cost	Rs. 400 per sq. ft.
Registration and other costs	2.5% of cost of construction

Elite Builders will also incur Rs.4 lakhs each in years 14 and 15 towards repairs

Elite builders proposes to charge the lease rentals as follows :

Years	*Rentals*
1 to 5	Normal
6 to 10	120% of Normal
11 to 15	150% of Normal

Elite Bulders' present tax rate averages at 50%. The full cost of construction and registration will be written off over 15 years and will be allowed for tax purposes.

You are required :

To calculate the normal lease rental per annum per flat.

For your exercise assume :

(a) Minimum desired return of 10%

(b) Rentals & repairs will arise on the last day of the year.

(c) Construction, registration and other costs will be incurred at time 'O'.

(d) The relevant discount factors are :

Year	*Discount Factor*	*Year*	*Discount Factor*	*Year*	*Discount Factor*
1	0.91	6	0.56	11	0.35
2	0.83	7	0.51	12	0.32

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3	0.75	8	0.47	13	0.29
4	0.68	9	0.42	14	0.26
5	0.62	10	0.39	15	0.24

Note : Comulative discount factors may be used.

(C.A.Final)

Solution :

CALCULATION OF NET CASH OUTFLOWS

	(Rs. in lakhs)
Cost of Construction in zero period	24.00
Cost of registration (2.5%) in zero Period	0.60
Net Cash Outflow in zero period	24.60
Cost of Repairs in 14th and 15th years	4.00
Less : Savings in Tax @ 50%	2.00
Net Cash Outflow	2.00

CALCULATION OF PRESENT VALUE OF NET CASH OUTFLOWS

Year	Net Cash Outflow (Rs. in lakhs)	P.V. Factor	Present Value of Cash Outflows (Rs. in lakhs)
0	24.60	1	24.60
14	2.00	0.26	0.52
15	2.00	0.24	0.48
	Total Present value of Cash Outflows		25.60

CALCULATION OF NET ANNUAL CASH INFLOWS

Cost of construction and registration	= Rs. 24.60 lakhs
Life of Lease	= 15 years
Annual cash inflow	$= 24.60 \times \frac{1}{15}$
Or, Annual cash Inflow	= 1.64 lakhs
Less : Tax @ 50%	= 0.82
Net annual cash inflow	= Rs. 0.82 lakhs

Cumulative present value factor from year 1 to 15 :

= 0.91 + 0.83+0.75+ 0.68 + 062+0.56+0.51+0.47+0.42+0.39+0.35 +0.32+0.29+0.26+0.24

= 7.60

Cumulative Present value of annual cash inflows = 0.82×7.60

= Rs. 6.32 lakhs (1)

Add : Present value of amount to be realised at the end of the 15the year:

Transfer Value	= Rs. 8 lakhs
Less Tax @ 50%	= Rs. 4 lakhs

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Net cash inflow 4 lakhs.

Present Value = Rs. 4.00×0.24 = Rs. 0.96 lakhs (2)

Thus, total Present value of Cash Inflows (1+2)

= Rs. 6.32 lakhs + 0.96 lakhs

=Rs. 7.28 lakhs

CALCLATION OF THE AMOUNT TO BE RECOVERED FROM LEASE RENTALS

	(Rs. Lakhs)
Total present value of cash outflows	25.60
Less :Present value of cash Inflows	7.28
Amount to be recovered from lease rentals	18,32

Cumulative P.V. Factor for years 1-5 = 0.91+ 0.83+ 0.75+ 0.68+ 0.62=3.79

Cumulative P.V.F for year 6-10 = 0.56+0.51+0.47+0.42+ 0.39 = 2.35

Cumulative P.V. F for years 11–15 = 0.35+ 0.32+ 0.29+ 0.26+ 0.24=1.46

Let us assume Lease Rent for 1-5 years (normal) as	3.79
then, LR for years 6-10 shall be 2.35 ×120 %	=2.82
and, LR for years 11-15 shall be= 1.46×150%	=2.19
Cumulative value	8.80
Less: Tax @ 50%	4.40
	4.40

Thus, Lease Rent $= \frac{18.32 \text{ lakhs}}{4.40}$

= Rs. 4,18,364

and, Lease rent per flat = Rs. 4,18,364 $\times \frac{1}{6}$

= Rs. 69,727.

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23

Price Level Accounting (Inflation Accounting)

Problem 23.1. Mr. X purchased a machine in 1982 for Rs. 1,00,000 when the general price index was 180. He sold this machine in 1991 for Rs. 1,65,000 when the general index was 270.

Calculate the profit or loss on the sale of the machine, keeping aside the price level changes.

Solution :

Purchase Price of Machine (original Cost) = Rs. 1,00,000

Sales Price = Rs. 1,65,000

It seems as if there is a profit of Rs. 65,000 (Rs. 1,65,000 – 1,00,000) but it is not so if the gain arising due to price level changes is ignored :

Converted Value of Machine at 1981 Index :

$$1,00,000 \times \frac{270}{180} = \text{Rs. } 1,50,000$$

So, Profit is Rs. 15,000 *i.e.,*

Sale Price – Converted Value of Machine (Rs. 1,65,000 – 1,50,000) = Rs. 15,000 profit.

Problem 23.2. A company has the following transactions at the given dates and price indices for the first quarter of 1995 :

	Rs.	*Price Index*
Opening Balance (January 1)	6,000	100
Cash Sales (February 1)	17,500	105
Payment to Creditors (March 1)	12,000	108
Cash Purchase (March 1)	2,000	108
Payment of Expenses (March 31)	2,000	110
Closing Balance (March 31)	7,500	110

Calculate Monetary gain or loss

Solution :

STATEMENT OF CASH

	Conventional Accounting	*Conversion Factor Rs.*	*Converted Values Rs.*
Opening Balance	6,000	110/100	6,600
Add : Cash Sales	17,500	110/105	18,333
	23,500		24,933

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Less : Cash Payment			
(i) Creditors	12,000	110/108	12,222
(ii) Purchases	2,000	110/108	2,037
(iii) Expenses	2,000	110/110	2,000
	16,000		16,259
Closing Balance *(i) – (ii)*	7,500		8,674

	Rs.
Expected Balance	8,674
Actual Balance	7,500
Monetary Loss	1,174

Problem 23.3. The information given below relates to monetary account of Jayanath Co. Ltd. Compute the general price Level gain or loss :

	as on 1.1.1995	*As on 31.12.1995*
Monetary Assets	80,000	1,00,000
Monetary Liabilities	1,00,000	1,00,000
Retail Price Index	200	300
Average Index for the year	240	

Solution :

(a) Calculation of Monetary Gain on account of holding of Monetary Liabilities :

Converted values of monetary liabilities 1.1.95 = 1,00,000 × $\frac{300}{200}$

= Rs. 1,50,000

Converted values of Monetary liabilities added during the year	1,50,000
Less : Historical value of liabilities on 31.12.1995	1,00,000
Gain on holding of monetary liabilities (1)	50,000

(b) Calculation of Monetary Loss on Account of holding of monetary assets :

Converted value of monetary assets (1.1 1995) = 80,000 × $\frac{300}{200}$

	1,20,000
Add : Converted value of monetary assets = 20,000 × $\frac{300}{240}$	25,000
	1,45,000
Less : Historical value of monetary assets on 31.12.1995	1,00,000
Loss on holding of monetary assets (2)	45,000

(c) Net Monetary Gain (1 – 2) = Rs. 50,000 – 45,000 = Rs. 5,000

Problem 23.4. H Company held shares in X company which it bought for Rs. 10,000 in 1991 when an index of the general level of prices stood at Rs. 110. At end of 1994, the market price of the shares was Rs. 8,000 and the index 132. At the end of 1995, the market price of the shares was Rs. 9.000 and the index 145.2.

(a) Calculate the CPP value of the shares at the end of 1994 and 1995.

(b) Under CPP accounting, what gain or loss would be shown in respect of the shares ?

(c) What, in fact, was the gain or loss in purchasing power in respect of the shares during 1995 ?

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Solution :

(a) *Calculation of CPP Value of Shares :*

Cost Price of Shares in 1991 = Rs. 10,000

Price Index in 1991 = 110

Price Index in 1994 = 132

CPP Value of Shares in 1994 $= 10,000 \times \frac{132}{110}$

$= \text{Rs. } 12,000$

Price Index in 1995 = 145.2

CPP Value of Shares in 1995 $= \frac{10,000 \times 145.2}{110}$

$= 13,200$

(b) *Cost price of Shares in 1991* = Rs. 10,000

CPP Value of Shares in 1994 = Rs. 12,000

CPP Value of Shares in 1995 = Rs. 13,200

Loss in 1994 = CPP value – Cost Price

= Rs. 12,000 – 10,000

= Rs. 2,000

Loss in 1995 = Rs. 13,200 – 10,000

= Rs. 3,200

(c) *CPP Value of Shares in 1994* = Rs. 12,000

CPP Value of Shares in 1995 = Rs. 13,200

Market Price of Shares in 1995 = Rs. 8,000

Market Price of Shares in 1995 = Rs. 9,000

Actual Loss (1994) = Rs. 12,000 – 8,000

= Rs. 4,000

Actual Loss (1995) = Rs. 13,200 – 9,000

= Rs. 4,200

Problem 18.5. The following is the trial balance of a company as on 31.12.95.

	Dr. Rs.	*Cr.* Rs.
Stock on Jan. 1, 1995	8,000	
Purchases	40,000	
Sales		54,000
Sundry Debtors	12,000	
Expenses	8,000	
Provision for Depreciation		6,400
Depreciation	1,600	
Capital		24,000
Reserves		2,000
Fixed Assets	16,000	
Bank Balance	6,800	
Sundry Creditors		6,000
	92,400	92,400

The following additional information is available :

1. Accounting has been recorded on conventional principles.
2. Closing stock which was purchased at the beginning of the fourth quarter is valued at cost price at Rs. 9,200.

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3. The accounts relate to the first year of inflation after a period of stable prices. During this year, the general index of the inflation arose from 100 to 140, the price of the commodity in which the company dealt also increased steadily, but only by 20 +, while the process of its fixed assets increased by 50.

You are required to prepare the final accounts in such a way which, according to you, will be best suited under such inflationary conditions, ignoring income-tax.

(Adapted Calcutta Uni., M. Com.)

Solution :

The given Trial Balance has first to be converted into the current values :

TRIAL BALANCE

	Orthodox Accounting		*Converted to Current Values*		
	Dr. *Rs.*	*Cr.* *Rs.*	*Conversion Factor*	*Dr.* *Rs.*	*Cr.* *Rs.*
Stock on Jan. 1, 1995	8,000		120/100	9,600	
Purchases	40,000		120/120	40,000	
Sales		54,000	120/120		54,000
Sundry Debtors	12,000		140/140	12,000	
Expenses	8,000		120/120		8,000
Provision for Depreciation		6,400	150/100		9,600
Depreciation	1,600		120/100	1,920	
Capital		24,000	140/100		33,600
Reserves		2,000	140/100		2,800
Fixed Assets	16,000		150/100	24,000	
Bank Balance	6,800		140/140	6,800	
Sundry Creditors		6,000	140/140		6,000
Closing stock (for Trading Account)		9,200	120/130		8,492
Closing Stock (for balance Sheet)	9,200		140/130	9,908	
	1,01,600	1,01,600		1,12,228	1,14,492
Loss due to Inflation (Balancing figure)				2,264	
				1,14,492	1,14,492

Notes :

(i) Closing stock has been shown in the Trial Balance on the Debit as well as Credit side as it appears on the Credit side of Trading Account and as an asset in the Balance Sheet.

(ii) For Trading Account Closing Stock has been converted by 120/130 as price of the goods rose by 20% only against purchase price of 130 at the beginning of the fourth quarter.

(iii) For Balance Sheet Closing Stock has been converted by 140/130 as index at the close of the year was 140 against purchase price of 130 at the beginning of the foruth quarter :

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TRADING AND PROFIT AND LOSS ACCOUNT

	Historical Values	*Current Values*		*Historical Values*	*Current Values*
	Rs.	*Rs.*		*Rs.*	*Rs.*
To Opening Stock	8,000	9,600	By Sales	54,000	54,000
To Purchases	40,000	40,000	By Closing Stock	9,200	8,492
To Gross profit	15,200	12,892			
	63,200	62,492		63,200	62,492
To Expenses	8,000	8,000	By Gross Profit	15,200	12,892
To Depreciation	1,600	1,920			
To Net Profit c/d	5,600	2,972			
	15,200	12,892		15,200	12,892
To Loss due to inflation	—	2,264	By Net Profit (before Loss due to Inflation)	5,600	2,972
To Net Profit	5,600	708			
	5,600	2,972		5,600	2,972

BALANCE SHEET

Liabilities	*Historical Values*	*Current Values*	*Assets*	*Historical Values*	*Current Values*
	Rs.	*Rs.*		*Rs.*	*Rs.*
Capital	24,000	33,600	Fixed Assets	16,000	24,000
Reserves	2,000	2,800	(at cost)		
Profit and Loss			Stock	9,200	9,908
Account	5,600	708	Sundry Debtors	12,000	12,000
Sundry Creditors	6,000	6,000	Bank Balance	6,800	6,800
Provision for Depreciation	6,400	9,600			
	44,000	52,708		44,000	52,708

* Alternatively, capital can be shown at the nominal value of Rs. 24,000. In that case, the difference will be transferred to Reserve Account, *i.e.*, Rs. 33,600 – 24,000 = Rs. 9,600 which will also be shown on the liabilities side.

Problem 23.6. A summary of balance sheet of Sun and Moon Co. Ltd. is given below :

	Rs.
Cash and Account Receivable	13,00,000
Plant and Equipement (Net of Depreciation)	14,00,000
Total Assets	27,00,000
Current Debts	6,00,000
Long-term Debts	10,00,000
Owner's Equity	11,00,000
Total Equities	27,00,000

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The current price index is 280. The plant and equipment and Long-term debt were acquired when the price index was at 180.

You are required to revise the summary balance sheet to restate assets and equities in terms of current rupees. How will you treat the monetary gain or loss, if any ?

Solution :

BALANCE SHEET

Liabilities	*Historical Values*	*Conversion Factor*	*Current values*	*Assets*	*Historical values*	*Conversion Factor*	*Current Values*
		Rs.	*Rs.*			*Rs.*	*Rs.*
Current Debts	6,00,000	280/280	6,00,000	Cash and Accounts Receivable	13,00,000	280/280	13,00,000
Debts Long term	10,00,000	280/280	10,00,000	Plant and Equipment	14,000,000	280/180	21,77,778
Owner's Equity	11,00,000	280/180	17,11,111	(Net of Dep.)			
Monetary Gain (balancing) figure)	—	—	1,66,667				
	27,00,000		34,77,778		27,00,000		34,77,778

Monetary Grain is to be added in Owner's Equity. So Owner's equity shall be Rs. 17,11,111 + 1,66,667 = Rs. 18,77,778.

Problem 23.7. The following are the balance sheets of ABC Co. Ltd.

Liabilities	*1991*	*1992*	*Assets*	*1991*	*1992*
	Rs.	*Rs.*		*Rs.*	*Rs.*
Equity share capital (Issued in 1979)	50,000	50,000	Land and Buildings (Purchased in 1969)	30,000	30,000
Profit and Loss A/c	5,000	6,500	Plant & Machinery (Purchased in 1979 for Rs. 26,000)	15,000	14,000
Creditors	5,000	7,000	Stocks	6,000	7,000
			Debtors	5,000	7,500
			Cash	4,000	5,000
	60,000	63,500		60,000	63,500

The index numbers are as follows :

Year	Index.
1979	100
1991	200
1992	225

You are required to prepare :

(i) Supplementary Comparative Balance Sheet in 1992 rupees.

(ii) Supplementary Income Statement in 1992 rupees.

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Solution :

First of all, we shall have to convert the assets and liabilities at current values, *i.e.*, 1992 rupees.

CONVERSION OF ASSETS AND LIABILITIES AT CURRENT VALUES

	Historical Values 1991	*Historical Values 1992*	*Conversion Factor*	*Converted Values 1991*	*Converted Values 1992*
Assets	*Rs.*	*Rs.*		*Rs.*	*Rs.*
Land & Buildings	30,000	30,000	225/100	67,500	67,500
Plant & Machinery	15,000	14,000	225/100	33,750	31,500
Stocks	6,000	7,000	225/200	6,750	7,000
Debtors	5,000	7,500	225/200	5,625	7,500
Cash	4,000	5,000	225/200	4,500	5,000
	60,000	63,500		1,18,125	1,18,500
Liabilities					
Creditors	5,000	7,000	225/200	5,625	7,000
Net Worth (A – L)	55,000	56,500		1,12,500	1,11,500
	60,000	63,500		1,18,125	1,18,500

Calculation of Loss from holding Net Current assets :

	Historical values for 1991	*Current Values for 1991*
	Rs.	*Rs.*
Stocks	6,000	6,750
Debtors	5,000	5,625
Cash	4,000	4,500
	15,000	16,875
Less : Creditors	5,000	5,625
	10,000	11,250

So, Loss from holding of Net Current Assets is Rs. 1,250, *i.e.*, Rs. 11,250–10,000.

SUPPLEMENT INCOME STATEMENT

for the year ended 31st Dec., 1992

	Rs.		*Rs.*
To Loss on holding of Net Current Assets	1,250	By Balance of Profit and Loss Account (6,500– 5,000)	1,500
To Additional Depreciation on Plant & Machinery [(33,750 – 31,500) – (15,000 – 14,000)]		By Loss for the year (balancing figure)	1,000
(*i.e.* Rs. 2,250 – 1,000	1,250		
	2,500		2,500

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SUPPLEMENTARY COMPARATIVE BALANCE SHEET

Liabilities	*1991*	*1992*	*Assets*	*1991*	*1992*
	Rs.	*Rs.*		*Rs.*	*Rs.*
Creditors	5,625	7,000	Land & Building	67,500	67,500
Net Worth	1,12,500	11,11,500[1]	Plant & Machinery	33,750	31,500
			Stocks	6,750	7,000
			Debtors	5,625	7,500
			Cash	4,500	5,000
	1,18,125	1,18,500		1,18,125	1,18,500

(1) Net Worth (1992) = Rs. 1,12,500 – 1,000 (Loss)
= Rs. 1,11,500.

(2) Net Worth may be shown as 1,12,500 in 1992 in that case Loss of Rs. 1,000 shall appear on Assets side.

(3) Alternatively, Share Capital may be shown at Nominal value and the difference be transferred to Revaluation Reserve Account.

Problem 23.8. The Balance Sheet of MSJ Ltd ; as on 1.1.1995 and the income statement for the year ending 31.12.1995 are set out as below :

BALANCE SHEET AS AT 1.1.1995

	Rs.		*Rs.*
Share Capital	10,000	New Machine	15,000
10% Debentures	6,000	Stock	2400
Creditors	3,600	Debtors	1,200
		Cash	1,000
	19,600		19,600

INCOME STATEMENT FOR THE YEAR ENDING 31.12.1995

	Rs.	*Rs.*
Sales		10,000
Cost of Goods sold :		
Opening stock (FIFO)	2400	
Net Purchases	4600	
	7000	
Less : Closing stock	2000	5,000
Gross Profit on sales		5,000
Operating expenses		
Depreciation	800	
Interest paid on debentures	1,500	
on 31.12.1995	600	2,900
Retained earnings		2,100

Debtors and Creditors balances remained constant throughout the year. General price index was as follows :

On 1.1.1995	200
Average for the year	240
On 31.12.1995	300

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You are required to prepare the final accounts for the year 1995 after adjusting for price level changes under CPP method. *(Madras, M. Com.)*

Solution :

Conversion factors for restating the items to present current purchasing power of the rupee as on 31.12.1995.

1st January 1995 $= \frac{300}{200} = 1.5$

Average for 1995 $= \frac{240}{200} = 1.2$

31st December 1995 $= \frac{300}{300} = 1.0$

(A) RESTATED INCOME STATEMENT

		Historical Values	*Conversion*	*CPP*
		Rs.	*Factor*	*Rs.*
Sales (1)		10,000	1.2	12,000
Opening stock (FIFO)		2,400	1.5	3600
Purchases		4,600	1.2	5,520
Cost of goods available for sale		7,000		9,120
Less : Closing stock (FIFO)		2,000	1.2	2,400
Cost of goods sold (2)		5,000		6,720
Gross Profit on Sales (1 – 2)		5,000		5,280
Operating expenses	800		1.2	960
Depreciation	1,500		1.5	2,250
Interest on Debentures	600		1.0	600
		2,900		3,810
Income before general price level gain or Loss		2,100		1,470
General price level gain (c)	—			2,780
Retained Earnings	2,100			4,250

(B) CALCULATION OF CASH BALANCE AT THE END OF THE YEAR

	Rs.	*Rs.*
Opening Balance		1,000
Sales		10,000
		11,000
Less : Purchases	4,600	
Operating expenses	800	
Interest	600	6,000
Closing Balance		5,000
Cash balance after providing for interest		5,000
Add : Interest on debentures		600
Cash balance before payment of interest		5,600

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Less :	Opening balance	1,000
	Additional Cash generated during the year	4,600

(c) **CALCULATION OF MONETARY GAIN OR LOSS**

		Rs.
Amount of Debentures and creditors should have gone up with general price index Rs. 9,600 × 1.5	14,400	
But these items stood at	9600	
∴ Gain on holding of liabilities		4,800
Cash and Debtors should have gone to 2,200 × 1.5	3,300	
Additional cash generated should have increased to 4,600 × 1.2	5,520	
But these items stood at (5,600 + 1,200)	8,820 6,800	
∴ Loss on holding of assets		(2,020)
∴ Net Monetary Gain		2,780

(d) **RESTATED BALANCE SHEET**

as on 31.12.1995

	Historical	Conversion Factor	CPP
Liabilities			
Share Capital	10,000	1.5	15,000
10% Debentures	6,000	1.0	6,000
Creditors	3,600	1.0	3,600
Retained Earnings	2,100		4,250
Total	21,700		28,850
Assets			
Cash	5,000	1.0	5,000
Debtors	1200	1.0	1,200
Stock	2,000	1.2	2,400
New Machine	13,500	1.5	20,250
(15000 – 1500)	21,700		28,850

Problem 23.9. Calculate the 'Cost of sales adjustment' (COSA) from the following under CCA method :

	Historical Cost	*Index No.*
	Rs.	
Opening stock	50,000	100
Purchases	1,80,000	120
Total goods	2,30,000	(average)
Less : Closing stock	84,000	140
Cost of sales	1,46,000	

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Solution :

$$\text{CO SA} = (C-O) - I_a\left(\frac{C}{I_c} - \frac{O}{I_o}\right)$$

where, C = Historical cost of closing stock
O = Historical cost of opening stock
I_a = Average Index number
I_c = Index number appropriate to closing stock
I_o = Index number appropriate to opening stock.

$$\text{COS A} = (84{,}000 - 50{,}000) - 120\left(\frac{8{,}4000}{140} - \frac{50{,}000}{100}\right)$$

$= 34{,}000 - 120\ (600 - 500)$
$= 34{,}000 - 12{,}000$
$=$ Rs. 22,000

Alternatively

	Rs.
Opening stock at average index $= 50{,}000 \times \frac{120}{100} =$	60,000
Add : Purchases at average index	1,80,000
	2,40,000
Less : Closing stock at average index $= 84{,}000 \times \frac{120}{140} =$	72,000
Current cost of sales	1,68,000

COS A = Current Cost of Sales – Historical Cost of Sales
= Rs. 1,68,000 – 1,46,000
= Rs. 22,000.

Problem 23.10. Calculate the amount of depreciation under 'Current Cost Accounting' (CCA) method for each of the four years as well as the backlog depreciation for a certain item of the asset from the following details :

Cost of Machine	Rs. 40,000
Estimated life	4 years
Residual Value	Nil
Inflation Factor	10% p.a.

Assume straight line method of depreciation.

Solution :

CALCULATION OF DEPRECIATION UNDER CCA METHOD

Year	*Historical Cost*	*Replacement Cost*	*Depreciation on Historical Cost*	*Depreciation on Replacement Cost*	*Additional Depreciation CCA Adjustment*
	(Rs.)	(Rs.)	(Rs.)	(Rs.)	(Rs.)
1	40,000	44,000	10,000	11,000	1,000
2	40,000	48,400	10,000	12,100	2,100
3	40,000	53,240	10,000	13,310	3,310
4	40,000	58,564	10,000	14,641	4,641
			40,000	51,051	11,051

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Solution :

CALCULATION OF BACK LOG DEPRECIATION

Year	Total Depreciation on		Total Additional Depreciation	Additional Annual Dep.	Dep. on CCA Adj.	Back log Depreciation
	Historical Cost	Replacement Cost				
	(Rs.)	(Rs.)	(Rs.)	(Rs.) X	(Rs.) Y	(Rs.) [x–y]
1	10,000	11000 (a)	1,000	1,000	1,000	—
2	20,000	24,000 (b)	4,200	3,200	2100	1100
3	30,000	39,930 (c)	9,930	5,730	3,310	2,420
4	40,000	58,564 (d)	18,564	8,634	4,641	3,993
				18,564		7,513

(a) $10,000 + \left(\frac{10}{100} \times 10,000\right) = \text{Rs. } 11,000$

(b) $20,000 + \left(\frac{10}{100} \times 20,000\right) + \left(\frac{10}{100} \times 22,000\right) = \text{Rs. } 24,200$

(c) $30,000 + \left(\frac{10}{100} \times 30,000\right) + \left(\frac{10}{100} \times 33,300\right) + \left(\frac{10}{100} \times 36,300\right) = \text{Rs. } 39,930$

(d) $40,000 + \left(\frac{10}{100} \times 40,000\right) + \left(\frac{10}{100} \times 44,000\right) + \left(\frac{10}{100} \times 48,400\right) + \left(\frac{10}{100} \times 53,240\right) = \text{Rs. } 58,564$

Problem 23.11. Calculate the Monetary Working Capital Adjustment (MWCA) from the following :

	Opening	Closing
Debtors	Rs. 5,000	Rs. 7,000
Creditors	Rs. 4,000	Rs. 4,600
Index Number	100	120
Average Index for the year	110	

Solution :

$$MWCA = (C - O) - I_a\left(\frac{C}{I_c} - \frac{O}{I_o}\right)$$

C = Closing monetary working capital = Rs. 7,000 – 4,600
= Rs. 2,400

O = Opening monetary working capital
= Rs. 5,000 – 4,000 = Rs. 1,000

I_a = Average Index = 110

I_c = Closing Index = 120

I_o = Opening Index = 100

Substituting the values :

$$MWCA = (2,400 - 1,000) - 1,10\left(\frac{2,400}{120} - \frac{1,000}{100}\right)$$

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$= 1,400 - 110\ (20 - 10)$
$= 1400 - 1100$
$=$ Rs. 300.

Problem 23.12. From the data given below, calculate the 'gearing adjustment' required under CCA method :

	Opening	*Closing*
	Rs.	*Rs.*
Debentures	5,000	5,000
Bank overdraft	4,000	6,000
Cash	1,000	1,000
Share capital	20,000	24,000
Reserves	4,000	6,000
Adjustments	*Rs.*	
COS A	2,000	
MWCA	1,000	
Depreciation	2,000	
Total	5,000	

Solution :

Calculation of Net Borrowings :

	Opening	*Closing*
	Rs.	*Rs.*
Debentures	5,000	5,000
Bank Overdraft	4,000	6,000
Bank Borrowings	9,000	11,000
Less : Cash (as this does not enter into MWCA)	1,000	1,000
Net Borrowings	8,000	10,000
Calculation of Shareholder's Funds		
Share Capital	20,000	24,000
Reserves	4,000	6,000
Shareholder's funds	24,000	30,000

Average Net Borrowings (B) $= \dfrac{8,000 + 10,000}{2} =$ Rs. 9,000

Average Shareholder's, funds (S) $= \dfrac{24,000 + 30,000}{2} =$ Rs. 27,000

Gearing Adjustment $= \dfrac{B}{B + S} \times A$

$= \dfrac{9,000}{(9,000 + 27,000)} \times 5,000$

$= \dfrac{9,000}{36,000} \times 5,000$

$=$ Rs. 1,250.

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Problem 23.13. From the particulars given below, find out the rate of return on capital employed when *(i)* conventional accounting is adopted, *(ii)* price level changes are considered :

Fixed Assets at cost	= Rs. 20,00,000
Accumulated Depreciation	= Rs. 6,000,000
Rate of Depreciation	=10%
Current Assets	= Rs. 8,00,000
Current Liabilities	= Rs. 2,00,000
Profit after tax	=Rs. 2,00,000
Rate of tax	= 50%
Replacement Cost of Fixed Assets	= Rs. 30,00,000.

Solution :

(i) Calculation of Return on Investment when Conventional Accounting is adopted :

	Rs.
Fixed Assets at Cost	20,00,000
Less : Accumulated Depreciation	6,00,000
	14,00,000
Add : Current Assets	8,00,000
Total Assets	22,00,000
Less : Current Liabilities	2,00,000
Capital Employed	20,00,000
Net Profit after tax	= Rs. 2,00,000

$$\text{Return on Capital Employed} = \frac{2,00,000}{20,00,000} \times 100$$

$$= 10\%$$

(ii) When price Level changes are considered :

		Rs.
	Net Profit after tax	2,00,000
Add :	Depreciation @ 10% on original cost	2,00,000
Add :	Tax already charged @ 50%	2,00,000
	Profit before depreciation and tax	6,00,000
Less :	Depreciation @ 10% on Replacement Cost of Rs. 30,00,000	3,00,000
		3,00,000
Less :	Tax @ 50%	1,50,000
	Net Profit	1,50,000
Capital Employed :		Rs.
	Fixed Assets at Replacement Cost	30,00,000
Less :	Accumulated Depreciation @ 10% on Replacement cost for three years	9,00,000
		21,00,000
Add :	Current assets	8,00,000
	Total Assets	29,00,000
Less :	Current Liabilities	2,00,000
	Capital Employed	27,00,000

$$\text{Return on Capital Employed} = \frac{1,50,000}{27,00,000} \times 100$$

$$= 5.556\%.$$

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Problem23.14. The summarised current cost Balance Sheets of Naveen Ltd. and its 60% owned subsidiary Pracheen Ltd. are as follows : *Rs. ('000)*

	Naveen Ltd.		*Pracheen Ltd.*	
	31.12.91	31.12.90	31.12.91	31.12.90
Fixed Assets	5,950	5,600	3,825	3,700
Investment in Pracheen Ltd.	600	600	—	—
Stock	3,450	1,500	1,155	1,040
Debtors *less* creditors	1,725	1,200	750	510
Taxation	(550)	(430)	(450)	(220)
Proposed dividends	(350)	(250)	—	—
	10,825	8,220	5,280	5,030
Share capital	3,000	3,000	1,000	1,000
Reserves	3,490	2,165	2,250	1,300
	6,490	5,165	3,250	2,300
Loans *less* cash	4,335	3,005	2,030	2,730
	10,825	8,220	5,280	5,030

The historical costing profit and loss accounts for the year ended 31.12.91 are as follows : *(Rs. '000)*

	Naveen Ltd.	*Pracheen Ltd.*
Turnover	15,500	12,100
Operating profit	1,700	1,300
Interest payable	400	340
Profit before tax	1,300	960
Tax	550	450
Profit after tax	750	510
Proposed dividend	350	—
Retained profit	400	510

Notes :

(i) The following current cost adjustments have been calculated :

	Naveen Ltd.	*Pracheen Ltd.*
Cost of sales	275	150
Monetary working capital	205	90
Depreciation	350	375

(ii) The following are the movements of the current cost reserves :

Surplus on revaluation :		
Fixed assets	1,200	800
Stock	350	165
Monetary working capital adjustment (as above)		

You are required to prepare :

(i) The consolidated current cost profit and loss account for the year ending 31.12.91 for the Naveen Group.

(ii) A statement of the movements on the group current cost reserve for the year ending 31.12.91] *(I.C.W.A. Final Dec., 1991)*

Solution :

Workings :

1. *Current Cost Operating Adjustment for the Group :* *(Rs. '000)*

Cost of Sales (275 + 150)	425

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Monetary Working Capital (205 + 90)	295
Depreciation (350 + 375)	725
Current Cost Operating Adjustment	1,445

2. *Current Cost Operating Adjustment for Pascheem Ltd. :*

Cost of Sales	150
Monetary Working Capital	90
Depreciation	375
Current Cost Operating Adjustment	615

3. Gearing Adjustment for the Group :

	1991 (Rs. '000)	1990 (Rs. '000)	
Fixed Assets (5950 + 3825)	9,775	(5,600 + 3,700)	9,000
Stock (3450 + 1155)	4605	(1,500 + 1,040)	2,540
Monetary Working Capital (1,725 + 750)	2,475	(1200 + 510)	1710
Net Operating Assets	16,855		13,550
Financing of Net Operating Assets (Group) :			
Loans *Less* Cash (4335 + 2030)	6375	(3055 + 2730)	5785
Tax (550 + 450)	1000	(430 + 220)	650
	7,365		6,435

Gearing Ratio

$$= \frac{7,365 + 6,435}{16,855 + 13,550} \times 100 = \frac{13,800}{30,405} \times 100$$

$$= 45.4\%$$

Gearing Adjustment = Current Cost Operating Adjustment × Gearing Ratio
= 1445 × 45.4%
=656

4. *Gearing Adjustment for Pascheem Ltd. :*

	1991	1990
Fixed Assets	3,825	3,700
Stock	1,155	1,040
M.W.C.	750	510
Net Operating Assets	5,730	5,250
Financing of Net Operating Assets :		
Loans Less Cash	2,030	2,730
Tax	450	220
	2,480	2,950

Gearing Ratio

$$= \frac{2,480 + 2,950}{5,730 + 5,250} \times 100 = \frac{5,430}{10,980} \times 100$$

$$= 49.45\%$$

Gearing Adjustment = 615 × 49.45%
= 304

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5. *Current Cost Profit (Share of outsiders 40%)*

Historical Profit of Pascheem Ltd.	510
Less : Current Cost Operating Adjustment (2)	615
	–105
Add : Gearing Adjustment (4)	304
Current Cost Profit	199
Share of outsiders (40%)	80

(i) CONSOLIDATED CURRENT COST PROFIT AND LOSS ACCOUNT

(for the year ending 31.12.1991 for the Naveen Group)

(Rs. '000)

Turnover (15,500 + 12,100)	27,600
Operating Profit (1,700 + 1,300)	3,000
Less : Current Cost Operating Adjustment (1)	1,445
Current Cost Operating Profit	1,555
Less : Interest Payable – Gearing Adjustment (740–656)	84
Current Cost Profit before tax	1,471
Tax (550 + 450)	1,000
Current Cost Profit after tax	471
Less : Share of Outsiders (5)	80
Less : Proposed Dividend (given)	391
	350
Retained Profit on Current Cost	41

(ii) STATEMENT OF THE MOVEMENTS ON THE GROUP CURRENT COST RESERVES

(For the year ending 31.12.1991)

(Rs. '000)

	Total	*Outsiders (Miniority Interest) 40% of Pascheem Ltd.*	*For the Group*
Surplus on Revaluation :			
Fixed Assets (1,200 + 800)	2,000	320	1,680
Stock (350 + 165)	515	66	449
M.W.C. Adj. (205 + 90)	295	36	259
Total	2,810	$\left(304 \times \frac{40}{100}\right)$ 422	2,388
Less : Gearing Adj.	656	122	534
	2,154	300	1,854

Problem 23.15. From the following information, you are required to find out the value of closing stock using *(i)* the average cost *(ii)* LIFO *(iii)* FIFO method of issue of materials :

March	1	Balance in Hand 1,200 units @ Rs. 4.00
March	5	Issued 60 units on Req. No. 108.
March	11	Issued 200 units on Req. No. 210.
March	14	Received 800 units @ Rs. 4.75.
March	15	Issued 400 units on Req. No. 274.
March	20	Returned for credit 60 units found defective received on March 14.
March	25	Received 1,000 units @ Rs. 5.00.
March	30	Issued 640 units on Req. No. 318. *(Adapted I.C.W.A. Inter.)*

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Solution :

(i) WEIGHTED AVERAGE COST METHOD

Date	Reference (Particulars)	Receipt			Issues			Balance		
		Qty.	Amt.	Per Unit	Qty.	Amt.	Per Unit	Qty.	Amt.	Per Unit
Mar. 1	Balance b/d							1,200	4,800	4.00
Mar. 5	Req. No. 108				60	240	4.00	1,140	4,560	4.00
Mar. 11	R. No. 210				200	800	4.00	940	3,760	4.00
Mar. 14	Gr. No. ...	800	3,800	4.75				1,740	7,560	4.345
Mar. 15	R. No. 274				400	1,738	4.345	1,340	5,822	4.345
Mar. 20	Returned				60	260	4.345	1,280	5,562	4.345
Mar. 25	Gr. No. ...	1,000	5,000	5.00				2,280	10,562	4.632
Mar. 30	R. No. 318				640	2,964	4,632	1,640	7,598	4.632

(ii) LIFO METHOD

Date	(Particulars)	Receipt			Issues			Balance		
		Qty.	Amt.	Cost Unit	Qty.	Amt.	Unit Cost	Qty.	Amt.	Unit Cost
Mar. 1	Balance b/d							1,200	4,800	4.00
Mar. 5	Req. No. 108				60	240	4.00	1,140	4,560	4.00
Mar. 11	R. No. 210				200	800	4.00	940	3,760	4.00
Mar. 14	Gr. No. ...	800	3,800	4.75				940	3,760	4.00
								800	3,800	4.75
Mar. 15	R. No. 274				400	1,900	4.75	940	3,760	4.00
								400	1,900	4.75
M ar. 20	Returned				60	285	4.75	940	3,760	4.00
								340	1,615	4.75
Mar. 25	Gr. No.	1,000	5,000	5.00				940	3,760	4.00
								340	1,615	4.75
								1,000	5,000	5.00
Mar. 30	R. No. 318				640	3,200	5.00	940	3,760	4.00
								340	1,615	4.75
								360	1,800	5.00
								1,640	7,175	

(iii) FIFO METHOD

Date	(Particulars)	Receipt			Issues			Balance		
		Qty. Units	Amt. Rs.	Unit Cost Rs.	Qty. Units	Amt. Rs.	Unit Cost Rs.	Qty. Units	Amt. Rs.	Unit Cost Rs.
Mar. 1	Balance b/d							1,200	4,800	4.00
Mar. 5	R. No. 108				60	240	4.00	1,140	4,560	4.00
Mar. 11	R. No. 210				200	800	4.00	940	3,760	4.00
Mar. 14	Gr. No. ...	800	3,800	4.75				940	3,760	4.00
										4.75
Mar. 15	R. No. 274				400	1,600	4.00	540	2,160	4.00
										4.75
Mar. 20	Return				60	285	4.75	540	2,160	4.00
								740	3,515	4.75
Mar. 25	Gr. No. ...	1,000	5,000	5.00				5.40	2,160	4.00
								740	3,515	4.75
								1,000	5,000	5.00
Mar. 30	R. No.	318			540	2,160	4.00	640	3,040	4.75
					100	475	4.75	1,000	5,000	5.00
								1,640	8,040	

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Problem 23.16. The following transactions occurred in purchases and issues of materials in organisation during October 1996 :

Receipts				*Issues*	
October	4	200 units @ 24/unit	October 5		250 units
October	10	150 units @ Rs. 23/unit	October 12		200 units
October	18	100 units @ 24/unit	October 25		250 units
October	22	100 units @ Rs. 23.50/unit.			

Stock on 1st October, 1996 was 200 units @ Rs. 25 per unit. You are required to find out the value of closing stock using *(i)* FIFO, and *(ii)* LIFO method of issue of materials. *(B. Com. Delhi)*

(i) FIFO METHOD

Date	Particulars	Receipt				Issues		Balance		
		Qty.	Amt.	Unit Cost	Qty.	Amt.	Unit Cost	Qty.	Amt.	Unit Cost
1981		Units	Rs.	Rs.	Units	Rs.	Rs.	Units	Rs.	Rs.
Oct. 1	Balance b/d							200	5,000	25.00
Oct. 4	G.R. No....	200	4,800	24.00				200	5,000	25,00
Oct. 4	G.R. No. ...	200		24.00				200	4,800	24.00
Oct. 5	Req. No. ...				200	5,000	25.00			
					50	1,200	24.00	150	3600	24.00
Oct. 10	G.R. No. ...	150	3,450	23.00				150	3600	23.00
								150	3,450	23.00
Oct. 12	Req. No. ...				150	3,600	24.00			
					50	1,150	23.00	100	2,300	22.00
Oct. 18	G.R. No. ...	100	2,400	24.00				100	2,300	23.00
								100	2,400	24.00
Oct. 24	G.R. No. ...	100	2,350	23.50				100	2,300	23.00
								100	2,400	24.00
								100	2,400	23.00
Oct. 25	Req. No. ...				100	2,300	23.00			
					100	2,400	24.00			
					50	1,175	23.50	50	1,175	23.50

(iii) LIFO METHOD

Date 1981	Particulars	Receipt				Issues		Balance		
		Qty. Units	Amt. Rs.	Unit Cost Rs.	Qty. Units	Amt. Rs.	Unit Cost Rs.	Qty. Units	Amt. Rs.	Unit Cost Rs.
Oct. 1	Balance b/d							200	5,000	25.00
Oct. 4	G.R. No. ...	200	4,800	24.00				200	5,000	25.00
								200	4,800	24.00
Oct. 5	Req. No. ...				200	4,800	24.00			
					50	1,250	25.00	150	3,750	25.00
Oct. 10	G.R. No. ...	150	3,450	23.00				150	3,750	25.00
								150	3,450	23.00
Oct. 12	Req. No....				150	3,450	23.00			
					50	1,250	25.00	100	2,500	25.00
Oct. 18	G.R. No....	100	2,400	24.00				100	2,500	25.00
								100	2,400	24.00
Oct. 22	G. R. No....	100	2,350	23.50				100	2,500	25.00
								100	2,400	24.00
								100	2,350	23.50
Oct. 25	Req. No. ...				100	2350	23.50			
					100	2,400	24.00			
					50	1,250	25.00	50	1,250	25.00

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Appendix : Tables

Table A	:	Compound Factor Tables (CF)
Table B	:	Annuity Compound Factor Tables (ACF)
Table C	:	Discount Factor (DF) or Present Value Tables
Table D	:	Annuity Discount Factor (ADF) or, Present Value of an Annuity Tables

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Table A
Compound Factors (CF)

Period	*Percent (i)*						
(n)	*1*	*2*	*3*	*4*	*5*	*6*	*7*
1.....	1.010	1.020	1.030	1.040	1.050	1.060	1.070
2.....	1.020	1.040	1.061	1.082	1.103	1.124	1.145
3.....	1.030	1.061	1.093	1.125	1.158	1.191	1.225
4.....	1.041	1.082	1.126	1.170	1.216	1.262	1.311
5.....	1.051	1.104	1.159	1.217	1.276	1.338	1.403
6.....	1.062	1.126	1.194	1.265	1.340	1.419	1.501
7.....	1.072	1.149	1.230	1.316	1.407	1.504	1.606
8.....	1.083	1.172	1.267	1.369	1.477	1.594	1.718
9.....	1.094	1.195	1.305	1.423	1.551	1.689	1.838
10.....	1.105	1,219	1.344	1.480	1.629	1.791	1.967
11.....	1.116	1.243	1.384	1.539	1.710	1.898	2.105
12.....	1.127	1.268	1.426	1.601	1.769	2.012	2.252
13.....	1.138	1.294	1.469	1.665	1.886	2.133	2.410
14.....	1.149	1.319	1.513	1.732	1.980	2.261	2.579
15.....	1.161	1.346	1.558	1.801	2.079	2.397	2.759
16.....	1.173	1.373	1.605	1.873	2.183	2.540	2.952
17.....	1.184	1.400	1.653	1.948	2.292	2.693	3.159
18.....	1.196	1.428	1.702	2.206	2.407	2.854	3.380
19.....	1.208	1.457	1.754	2.107	2.527	3.026	3.617
20.....	1.220	1.486	1.806	2.191	2.653	3.207	3.870
25.....	1.282	1.641	2.094	2.666	3.38(	4.292	5.427
30.....	1.348	1.811	2.427	3.243	4.322	5.743	7.612
40.....	1.489	2.208	3.262	4.801	7.040	10.286	14.974
50.....	1.645	2.692	4.384	7.107	11.467	18.420	29.457

Table A (CF) (continued)

Period (n)	Percent (i)						
	8	9	10	11	12	13	14
1.....	1.080	1.090	1.100	1.110	1.120	1.130	1.140
2.....	1.166	1.188	1.210	1.232	1.254	1.277	1.300
3.....	1.260	1.295	1.331	1.368	1.405	1.443	1.482
4.....	1.360	1.412	1.464	1.518	1.574	1.630	1.689
5.....	1.469	1.539	1.611	1.685	1.762	1.842	1.925
6.....	1.587	1.677	1.772	1.870	1.974	2.082	2.195
7.....	1.714	1.828	1.949	2.076	2.211	2.353	2.502
8.....	1.851	1.993	2.144	2.305	2.476	2.658	2.853
9.....	1.999	2.172	2.358	2.558	2.773	3.004	3.252
10.....	2.159	2.367	2.594	2.839	3.106	3.395	3.707
11.....	2.332	2.580	2.853	3.152	3.479	3.836	4.226
12.....	2.518	2.813	3.138	3.498	3.896	4.335	4.818
13.....	2.720	3.066	3.452	3.883	4.363	4.898	5.492
14.....	2.937	3.342	3.797	4.310	4.887	5.535	6.261
15.....	3.172	3.642	4.177	4.785	5.474	6.254	7.138
16.....	3.426	3.970	4.595	5.311	6.130	7.067	8.137
17.....	3.700	4.328	5.054	5.895	6.866	7.986	9.276
18.....	3.996	4.717	5.560	6.544	7.690	9.024	10.575
19.....	4.316	5.142	6.116	7.263	8.613	10.197	12.056
20.....	4.661	5.604	6.727	8.062	9.646	11.523	13.743
25.....	6.848	8.623	10.835	13.585	17.000	21.231	26.462
30.....	10.063	13.268	17.449	22.892	29.960	39.116	50.950
40.....	21.725	31.409	45.259	65.001	93.051	132.78	188.88
50.....	46.902	74.358	117.39	184.57	289.00	450.74	700.23

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Table A (CF) (continued)

Period (n)	Percent (i)							
	15	16	17	18	19	20	25	30
1.....	1.150	1.160	1.170	1.180	1.190	1.200	1.250	1.300
2.....	1.323	1.346	1.369	1.392	1.416	1.440	1.563	1.690
3.....	1.521	1.561	1.602	1.643	1.685	1.728	1.953	2.197
4.....	1.749	1.811	1.874	1.939	2.005	2.074	2.441	2.856
5.....	2.011	2.100	2.192	2,288	2,386	2.488	3.052	3.713
6.....	2.313	2.436	2.565	2.700	2.840	2.986	3.815	4.827
7.....	2.660	2.826	3.001	3.185	3.379	3.583	4.768	6.276
8.....	3.059	3.278	3.511	3.759	4.021	4.300	5.960	8.157
9.....	3.518	3.803	4.108	4.435	4.785	5.160	7.451	10.604
10.....	4.046	4.411	4.807	5.234	5.696	6.192	9.313	13.786
11.....	4.652	5.117	5.624	6.176	6.777	7.430	11.642	17.922
12.....	5.350	5.936	6.580	7.288	8.064	8.916	14.552	23.298
13.....	6.153	6.886	7.699	8.599	9.596	10.699	18.190	30.288
14.....	7.076	7.988	9.007	10.147	11.420	12.839	22.737	39.374
15.....	8.137	9.266	10.539	11.974	13.590	15.407	28.422	51.186
16.....	9.358	10.748	12.330	14.129	16.172	18.488	35.527	66.542
17.....	10.761	12.468	14.426	16.672	19.244	22.186	44.409	86.504
18.....	12.375	14.463	16.879	19.673	22.091	26.623	55.511	112.46
19.....	14.232	16.777	19.748	23.214	27.252	31.948	69.389	146.19
20.....	16.367	19.461	23.106	27.393	32.429	38.388	86.736	190.05
25.....	32.919	40.874	50.658	62.669	77.388	95.396	264.70	705.64
30.....	66.212	85.850	111.07	143.37	184.68	237.38	807.79	2,620.0
40.....	267.86	378.72	533.87	750.38	1,051.7	1,469.8	7,523.2	36,119
50.....	1,083.7	1,670.7	2,566.2	3,927.4	5,988.9	9,100.4	70,065	4,97,929

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Table B
Annuity Compound Factors (ACF)

Period (n)	Percent (i)						
	1	2	3	4	5	6	7
1.....	1.000	1.000	1.000	1.000	1.000	1.000	1.000
2.....	2.010	2.020	2.030	2.040	2.050	2.060	2.070
3.....	3.030	3,060	3.091	3.122	3.153	3.184	3.215
4.....	4.060	4.122	4.184	4.246	4.310	4.375	4.440
5.....	5.101	5.204	5.309	5.416	5.526	5.637	5.751
6.....	6.152	6.308	6.468	6.633	6.802	6.975	7.153
7.....	7.214	7.434	7.662	7.898	8.142	8.394	8.654
8.....	8.286	8.583	8.892	9.214	9.549	9.897	10.260
9.....	9.369	9.755	10.159	10.583	11.027	11.491	11.978
10.....	10.462	10.950	11.464	12.006	12.578	13.181	13.816
11.....	11.567	12.169	12.808	13.486	14.207	14.972	15.784
12.....	12.683	13.412	14.192	15.026	15.917	16.870	17.888
13.....	13.809	14.680	15.618	16.627	17.713	18.882	20.141
14.....	14.947	15.974	17,086	18.292	19.599	21.015	22.550
15.....	16.097	17.293	18.599	20.024	21.579	23.276	25.129
16.....	17.258	18.639	20.157	21.825	23.657	25.673	27.888
17.....	18.430	20.012	21.762	23.698	25.840	20.213	30.840
18.....	19.615	21.412	23.414	25.645	28.132	30.906	33.999
19.....	20.811	22.841	25.117	27.671	30.539	33.760	37.379
20.....	22.019	24.297	26.870	29.778	33.066	36.786	40.995
25.....	28.243	32.030	36.459	41.646	47.727	54.865	63.249
30.....	34.785	40.588	47.575	56.085	66.439	79.058	94.461
40.....	48.886	60.402	75.401	95.026	120.80	164.76	199.64
50.....	64.463	84.579	112.80	152.67	209.35	290.34	406.53

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Table B (ACF) (continued)

Period (n)	Percent (i)							
	8	9	10	11	12	13	14	15
1.....	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
2.....	2.080	2.090	2.100	2.110	2.120	2.130	2.140	2.150
3.....	3.246	3.278	3.31`0	3.342	3.374	3.407	3.440	3.473
4.....	4.506	4.573	4.641	4.710	4.779	4.850	4.921	4.993
5.....	5.867	5.985	6.105	6.228	6.353	6,480	6.610	6.742
6.....	7.336	7.523	7.716	7.913	8.115	8.323	8.536	8.754
7.....	8.923	9.200	9.487	9.783	10.089	10.405	10.730	11.067
8.....	10.637	11.028	11.436	11.859	12.300	12.757	13.233	13.727
9.....	12.488	13.021	13.579	14.164	14.776	15.416	16.085	16.786
10.....	14.487	15.193	15.937	16.722	17.549	18.420	19.337	20.304
11.....	16.645	17.560	18.531	19.561	20.655	21.814	23.045	24.349
12.....	18.977	20.141	21.384	22.713	24.133	25.650	27.271	29.002
13.....	21.495	22.953	24.523	26.212	28.029	29.985	32.089	34.352
14.....	24.215	26.019	27.975	30.095	32.393	34.883	37.581	40.505
15.....	27.152	29.361	31.772	34.405	37.280	40.417	43.842	47.580
16.....	30.324	33.003	35.950	39.190	42.753	46.672	50.980	55.717
17.....	33.750	36.974	40.545	44.501	48.884	53.739	59.118	65.075
18.....	37.450	41.301	45.599	50.396	55.750	61.725	68.394	75.836
19.....	41.446	46.018	51.159	56.939	63.440	70.749	78.969	88.212
20.....	45.762	51.160	57.275	64.203	72.052	80.947	91.025	102.44
25.....	73.106	84.701	98.347	114.47	133.33	155.62	181.87	212.79
30.....	113.28	136.31	164.49	199.02	241.33	293.20	356.79	434.75
40.....	259.06	337.89	442.59	581.83	767.09	1,013.7	1,342.0	1,779.1
50.....	573.77	815.08	1,163.9	1,668.8	2,400.0	3,459.5	4,994.5	7,217.7

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Table B (ACF) (continued)

Period (n)	Percent (i)						
	16	17	18	19	20	25	30
1.....	1.000	1.000	1.000	1.000	1.000	1.000	1.000
2.....	2.160	2.170	2.180	2.190	2.200	2.250	2.300
3.....	3.506	3.539	3.572	3.606	3.640	3.813	3.900
4.....	5.066	5.141	5.215	5.291	5.368	5.766	6.187
5.....	6.877	7.014	7.154	7.297	7.442	8.207	9.043
6.....	8.977	9.207	9.442	9.683	9.930	11.259	12.756
7.....	11.414	11.772	12.142	12.523	12.916	15.073	17.583
8.....	14.240	14.773	15.327	15.902	16.499	19.842	23.858
9.....	17.519	18.285	19.086	19.923	20. 799	25.802	32.015
10.....	21.321	22.393	23.521	24.701	25.959	33.253	42.619
11.....	25.733	27.200	28.755	30.404	32.150	42.566	56.405
12.....	30.850	32.824	34.931	37.180	39.581	54.208	74.327
13.....	36.786	39.404	42.219	45.244	48.497	68.760	97.625
14.....	43.672	47.103	50.818	54.841	59.196	86.949	127.91
15.....	51.660	56.110	60.965	66.261	72.035	109.69	167.29
16.....	60.925	66.649	72.939	79.850	87.442	138.11	218.47
17.....	71.673	78.979	87.068	96.022	105.93	173.64	285.01
18.....	84.141	93.406	103.74	115.27	128.12	218.05	371.52
19.....	98.603	110.29	123.41	138.17	154.74	273.56	483.97
20.....	115.38	130.03	146.63	165.42	186.69	342.95	630.17
25.....	249.21	292.11	342.60	402.04	471.98	1,054.8	2,348.8
30.....	530.31	647.44	790.95	966.7	1,181.9	3,227.2	8,730.0
40.....	2360.8	3,134.5	4,163.21	5,529.8	7,343.9	30,089	1,20,393.0
50.....	10,436	15,090	21,813	31,515	45,497	2,80,256	1,65,976

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Table C
Discount Factors (DF) or Present Value Tables

Period (n)	Percent (i)								
	1	2	3	4	5	6	7	8	9
1.....	0.990	0.980	0.971	0.962	0.952	0.943	0.935	0.926	0.917
2.....	0.980	0.961	0.943	0.925	0.907	0.890	0.873	0.857	0.842
3.....	0.971	0.942	0.915	0.889	0.864	0.840	0.816	0.794	0.772
4.....	0.961	0.924	0.888	0.855	0.823	0.792	0.763	0.735	0.708
5.....	0.951	0.906	0.863	0.822	0.784	0.747	0.713	0.681	0.650
6.....	0.942	0.888	0.837	0.790	0.746	0.705	0.666	0.630	0.596
7.....	0.933	0.871	0.813	0.760	0.711	0.665	0.623	0.583	0.547
8.....	0.923	0.853	0.789	0.731	0.677	0.627	0.582	0.540	0.502
9.....	0.914	0.837	0.766	0.703	0.645	0.592	0.544	0.500	0.460
10.....	0.905	0.820	0.744	0.676	0.614	0.558	0.508	0.463	0.422
11.....	0.896	0.804	0.722	0.650	0.585	0.527	0.475	0.429	0.388
12.....	0.887	0.788	0.701	0.625	0.557	0.497	0.444	0.397	0.356
13.....	0.879	0.773	0.681	0.601	0.530	0.469	0.415	0.368	0.326
14.....	0.870	0.758	0.661	0.577	0.505	0.442	0.388	0.340	0.299
15.....	0.861	0.743	0.642	0.555	0.481	0.417	0.362	0.315	0.275
16.....	0.853	0.728	0.628	0.534	0.458	0.394	0.339	0.292	0.252
17.....	0.844	0.714	0.605	0.513	0.436	0.371	0.317	0.270	0.231
18.....	0.836	0.700	0.587	0.494	0.416	0.350	0.296	0.250	0.212
19.....	0.828	0.686	0.570	0.475	0.396	0.331	0.277	0.232	0.194
20.....	0.820	0.673	0.554	0.456	0.377	0.312	0.258	0.215	0.178
25.....	0.780	0.610	0.478	0.375	0.295	0.233	0.184	0.146	0.116
30.....	0.742	0.552	0.412	0.308	0.231	0.174	0.131	0.099	0.075
40.....	0.672	0.453	0.307	0.208	0.142	0.097	0.067	0.046	0.032
50.....	0.608	0.372	0.228	0.141	0.087	0.054	0.034	0.021	0.013

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Table C (DF) (continued)

Period (n)	Percent (i)								
	10	*11*	*12*	*13*	*14*	*15*	*16*	*17*	*18*
1.....	0.909	0.901	0.893	0.885	0.877	0.870	0.862	0.855	0.847
2.....	0.826	0.812	0.797	0.783	0.769	0.756	0.743	0.731	0.718
3.....	0.751	0.731	0.712	0.693	0.675	0.658	0.641	0.624	0.609
4.....	0.683	0.659	0.636	0.613	0.592	0.572	0.552	0.534	0.516
5.....	0.621	0.593	0.567	0.543	0.519	0.497	0.476	0.456	0.437
6.....	0.564	0.535	0.507	0.480	0.456	0.432	0.410	0.390	0.370
7.....	0.513	0.482	0.452	0.425	0.400	0.376	0.354	0.333	0.314
8.....	0.467	0.434	0.404	0.376	0.351	0.327	0.305	0.285	0.266
9.....	0.424	0.391	0.361	0.333	0.300	0.284	0.263	0.243	0.225
10.....	0.386	0.352	0.322	0.295	0.270	0.247	0.227	0.208	0.191
11.....	0.350	0.317	0.287	0.261	0.237	0.215	0.195	0.178	0.162
12.....	0.319	0.286	0.257	0.231	0.208	0.187	0.168	0.152	0.137
13.....	0.290	0.258	0.229	0.204	0.182	0.163	0.145	0.130	0.116
14.....	0.263	0.232	0.205	0.181	0.160	0.141	0.125	0.111	0.099
15.....	0.239	0.209	0.183	0.160	0.140	0.123	0.108	0.095	0.084
16.....	0.218	0.188	0.163	0.141	0.123	0.107	0.093	0.081	0.071
17.....	0.198	0.170	0.146	0.125	0.108	0.093	0.080	0.069	0.060
18.....	0.180	0.153	0.130	0.111	0.095	0.081	0.069	0.059	0.051
19.....	0.164	0.138	0.116	0.098	0.083	0.070	0.060	0.051	0.043
20.....	0.149	0.124	0.104	0.087	0.073	0.061	0.051	0.043	0.037
25.....	0.092	0.074	0.059	0.047	0.038	0.030	0.024	0.020	0.016
30.....	0.057	0.044	0.033	0.026	0.020	0.015	0.012	0.009	0.007
40.....	0.022	0.015	0.011	0.008	0.005	0.004	0.003	0.002	0.001
50.....	0.009	0.005	0.003	0.002	0.001	0.001	0.001	0	0

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Table C (DF) (continued)

Period (n)	Percent (i)						
	19	20	25	30	35	40	50
1.....	0.840	0.833	0.800	0.769	0.741	0.714	0.667
2.....	0.706	0.694	0.640	0.592	0.549	0.510	0.444
3.....	0.593	0.579	0.512	0.455	0.406	0.364	0.296
4.....	0.499	0.482	0.410	0.350	0.301	0.260	0.198
5.....	0.419	0.402	0.320	0.269	0.223	0.186	0.132
6.....	0.352	0.335	0.262	0.207	0.165	0.133	0.088
7.....	0.296	0.279	0.210	0.159	0.122	0.095	0.059
8.....	0.249	0.233	0.168	0.123	0.091	0.068	0.039
9.....	0.209	0.194	0.134	0.094	0.067	0.048	0.026
10.....	0.176	0.162	0.107	0.073	0.050	0.035	0.017
11.....	0.148	0.135	0.086	0.056	0.037	0.025	0.012
12.....	0.124	0.112	0.069	0.043	0.027	0.018	0.008
13.....	0.104	0.093	0.055	0.033	0.020	0.013	0.005
14.....	0.088	0.078	0.044	0.025	0.015	0.009	0.003
15.....	0.074	0.065	0.035	0.020	0.011	0.006	0.002
16.....	0.062	0.054	0.028	0.015	0.008	0.005	0.002
17.....	0.052	0.045	0.023	0.012	0.006	0.003	0.001
18.....	0.044	0.038	0.018	0.009	0.005	0.002	0.001
19.....	0.037	0.031	0.014	0.007	0.003	0.002	0
20.....	0.031	0.026	0.012	0.005	0.002	0.001	0
25.....	0.013	0.010	0.004	0.001	0.001	0	0
30.....	0.005	0.004	0.001	0	0	0	0
40.....	0.001	0.001	0	0	0	0	0
50.....	0	0	0	0	0	0	0

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Table D
Annuity Discount Factors (ADF)

Period (n)	Percent (i)								
	1	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*
1.....	0.990	0.980	0.971	0.962	0.952	0.943	0.935	0.926	0.917
2.....	1.970	1.942	1.913	1.886	0.159	1.833	1.808	1.783	1.759
3.....	2.941	2.844	2.829	2.775	2.723	2.673	2.624	2.577	2.531
4.....	3.902	3.808	3.717	3.630	3.546	3.465	3.387	3.312	3.240
5.....	4.853	4.713	4.580	4.452	4.329	4.212	4.100	3.993	3.890
6.....	5.795	5.601	5.417	5.242	5.076	4.917	4.767	4.623	4.486
7.....	6.728	6.472	6.230	6.002	5.786	5.582	5.389	5.206	5.033
8.....	7.652	7.325	7.020	6.733	6.463	6.210	5.971	5.747	5.535
9.....	8.566	8.162	7.786	7.435	7.108	6.802	6.515	6.247	5.995
10.....	9.471	8.983	8.530	8.111	7.722	7.360	7.024	6.710	6.418
11.....	10.368	9.787	9.253	8.760	8.306	7.887	7.499	7.139	6.805
12.....	11.255	10.575	9.954	9.385	8.863	8.384	7.943	7.536	7.161
13.....	12.134	11.348	10.635	0.986	9.394	8.853	8.358	7.904	7.487
14.....	13.004	12.106	11.296	10.563	9.899	9.295	8.745	8.244	7.786
15.....	13.865	12.849	11.938	11.118	10.380	9.712	9.108	8.559	8.061
16.....	14.718	13.578	12.561	11.652	10.838	10.106	9.447	8.851	8.313
17.....	15.562	14.292	13.166	12.166	11.274	10.477	9.763	9.122	8.544
18.....	16.398	14.992	13.754	12.659	11.690	10.828	10.059	9.372	8.756
19.....	17.226	15.678	14.324	13.134	12.085	11.158	10.336	9.604	8.950
20.....	18.046	16.351	14.877	13.590	12.462	11.470	10.594	9.818	9.129
25.....	22.023	19.523	17.413	15.622	14.094	12.783	11.654	10.675	9.823
30.....	25.808	22.396	19.600	17.292	15.372	13.765	12.409	11.258	10.274
40.....	32.835	27.355	23.115	19.793	17.159	15.046	13.332	11.925	10.757
50.....	39.196	31.424	25.730	21.482	18.256	15.762	13.801	12.223	10.962

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Table D (ADF) (continued)

Period (n)	Percent (i)								
	10	11	12	13	14	15	16	17	18
1.....	0.909	0.901	0.893	0.885	0.877	0.870	0.862	0.855	0.847
2.....	1.736	1.713	1.690	1.668	1.647	1.626	1.605	1.585	1.566
3.....	2.487	2.444	2.402	2.361	2.322	2.283	2.246	2.210	2.174
4.....	3.170	3.102	3.037	2.974	2.914	2.855	2.798	2.743	2.690
5.....	3.791	3.696	3.605	3.517	3.433	3.352	3.274	3.199	3.127
6.....	4.355	4.231	4.111	3.998	3.889	3.784	3.685	3.589	3.498
7.....	4.868	4.712	4.564	4.423	4.288	4.160	4.039	3.922	3.812
8.....	5.335	5.146	4.968	4.799	4.638	4.487	4.344	4.207	4.078
9.....	5.759	5.537	5.328	5.132	4.946	4.772	4.607	4.451	4.303
10.....	6.145	5.889	5.650	5.426	5.216	5.019	4.833	4.659	4.494
11.....	6.495	6.207	5.938	5.687	5.453	5.234	5.029	4.836	4.656
12.....	6.814	6.492	6.194	5.918	5.660	5.421	5.197	4.988	4.793
13.....	7.103	6.750	6.424	6.122	5.842	5.583	5.342	5.118	4.910
14.....	7.367	6.982	6.628	6.302	6.002	5.724	5.468	5.229	5.008
15.....	7.606	7.191	6.811	6.462	6.142	5.847	5.575	5.324	50.92
16.....	7.824	7.379	6.974	6.604	6.265	5.954	5.668	5.405	5.162
17.....	8.022	7.549	7.102	6.729	6.373	6.047	5.749	5.475	5.222
18.....	8.201	7.702	7.250	6.840	6.467	6.128	5.818	5.534	5.273
19.....	8.365	7.839	7.366	6.938	6.550	6.198	5.877	5.584	5.316
20.....	8.514	7.963	7.469	7.025	6.623	6.259	5.929	5.628	5.353
25.....	9.077	8.422	7.843	7.330	6.873	6.464	6.097	5.766	5.467
30.....	9.427	8.694	8.055	7.496	7.003	6.566	6.177	5.829	5.517
40.....	9.7789	8.951	8.244	7.634	7.105	6.642	6.233	5.871	5.548
50.....	9.915	9.042	8034	7.675	7.133	6.661	6.246	5.880	5.554

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Table D (ADF) (continued)

Period (n)	Percent (i)						
	19	20	25	30	35	40	50
1.....	0.840	0.833	0.800	0.769	0.741	0.714	0.667
2.....	1.547	1.528	1.440	1.361	1.289	1.224	1.111
3.....	2.140	2.106	1.952	1.816	1.696	1.589	1.407
4.....	2.639	2.589	2.362	2.166	1.997	1.849	1.605
5.....	3.058	2.991	2.689	2.436	2.220	2.035	1.737
6.....	3.410	3.326	2.951	2.643	2.385	2.168	1.824
7.....	3.706	3.605	3.161	2.802	2.508	2.263	1.883
8.....	3.954	3.837	3.329	2.925	2.598	2.331	1.922
9.....	4.163	4.031	3.463	3.019	2.665	2.379	1.948
10.....	4.339	4.192	3.571	3.092	2.715	2.414	1.965
11.....	4.486	4.327	3.656	3.147	2.752	2.438	1.977
12.....	4.611	4.439	3.725	3.190	2.779	2.456	1.985
13.....	4.715	4.533	3.780	3.223	2.799	2.469	1.990
14.....	4.802	4.611	3.824	3.249	2.814	2.478	1.993
15.....	4.876	4.675	3.859	3.268	2.825	2.484	1.995
16.....	4.938	4.730	3.887	3.283	2.834	2.489	1.997
17.....	4.988	4.775	3.910	3.295	2.840	2.492	1.998
18.....	5.033	4.812	3.928	3.304	2.844	2.494	1.999
19.....	5.070	4.843	3.942	3.311	2.848	2.496	1.999
20.....	5.101	4.870	3.954	3.316	2.850	2.497	1.999
25.....	5.195	4.948	3.985	3.329	2.856	2.499	2.000
30.....	5.235	4.979	3.995	3.332	2.857	2.500	2.000
40.....	5.258	4.997	3.999	3.333	2.857	2.500	2.000
50.....	5.262	4.999	4.000	3.333	2.857	2.500	2.000

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